

2130
Jan

THE
ENTOMOLOGIST'S
MONTHLY MAGAZINE:

CONDUCTED BY

C. G. BARRETT, F.E.S. R. McLACHLAN, F.R.S.
J. W. DOUGLAS, F.E.S. E. SAUNDERS, F.L.S.
W. W. FOWLER, M.A., F.L.S. H. T. STANTON, F.R.S.

VOL. XXV.

Observations, however minute and isolated, may, if careful and accurate,
contribute usefully to the general advancement of science.

George Bentham.



LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

1888-89.

2d. net

QL 461
E98
2d set.

LONDON :

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

MDCCCLXXXIX.

More than a quarter of a century has passed since (early in the spring of 1864) it was decided to establish the ENTOMOLOGIST'S MONTHLY MAGAZINE.

The basis upon which it was established may be found in the Preface to Vol. i. In the first instance that it would be conducted without hope or desire of pecuniary gain on the part of its proprietors; and secondly, that it would be both popular and scientific. The latter idea has, we venture to think, been fully realized; as to the former, we can only say that no balance is in hand, and that when the financial results of more than 25 years' working can be adjusted, it is believed there will be no deficit.

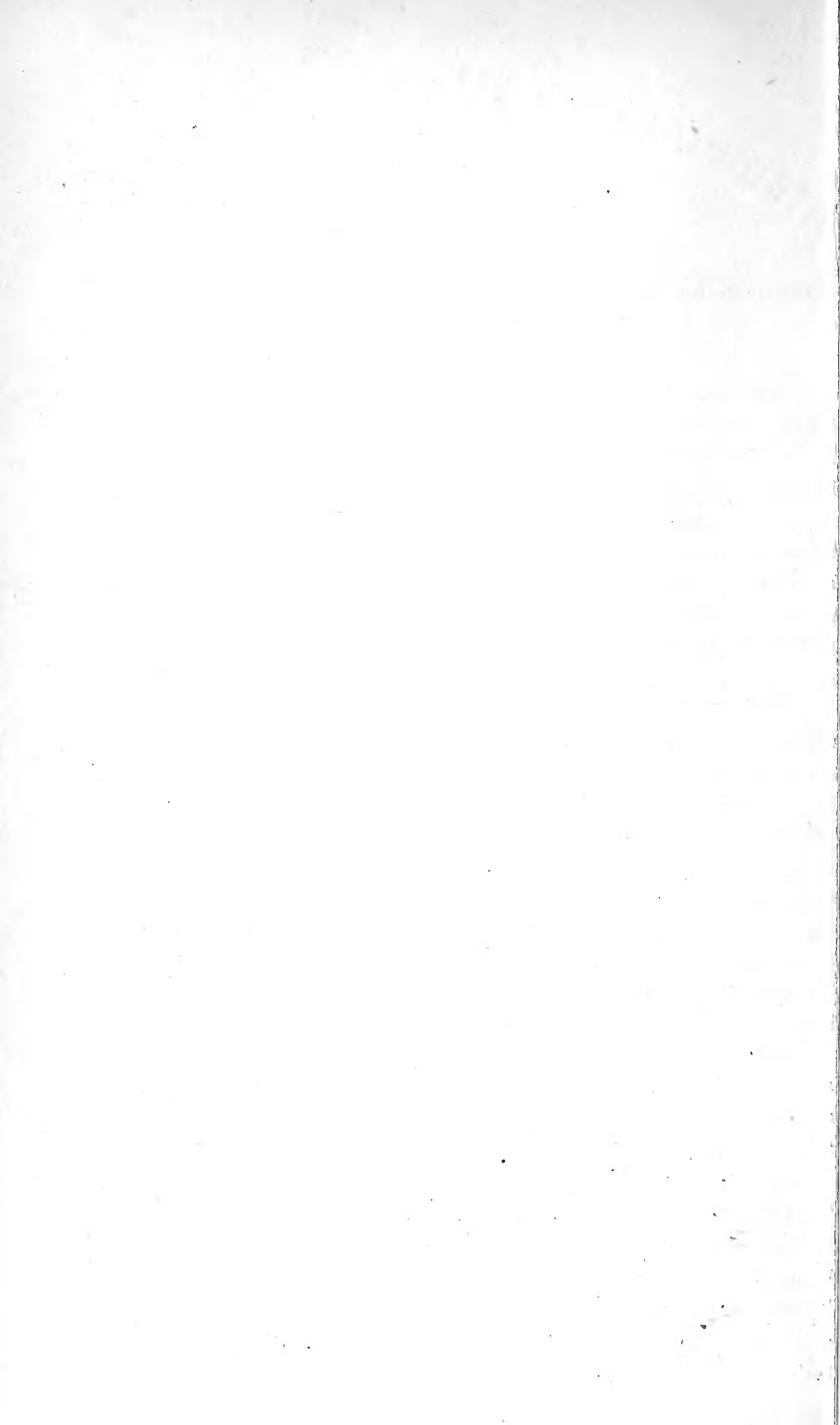
It has been decided to commence a nominal SECOND SERIES. There will be no radical change in the constitution of the Magazine, other than by frequently increasing the number of pages and illustrations (without extra charge): endeavours will be constantly used to render it still more generally useful.

Vol. xxv has extended to a somewhat inconvenient bulk, necessitated by the resolve to commence each Vol. of the Second Series in January, and to end it in December. This has been repeatedly urged upon us.

The two Editors who took part at the inauguration of the Magazine in 1864, and who still remain on the staff, have no reason to regret the result of their endeavours to further, through its pages, the cause of Entomology during the period that has since elapsed. Those of the Editors who have joined at subsequent periods share this feeling.

The fact of a Magazine devoted to Entomology, conducted absolutely on non-commercial principles, existing for more than 25 years, is probably unique in the annals of Natural History journalism. The Editors ask the present supporters to continue their aid, and to induce others to supplement it on the occasion of what will be practically a new departure, by their endeavours to further the sale of a journal which has been, and will continue to be, "a labour of love."

H. T. STANTON, } *Two original Editors,*
R. McLACHLAN, } *on behalf*
 } *of their Colleagues.*



Entomologist's Monthly Magazine

VOLUME XXV.

COLEOPHORA FRISCHELLA, L. (= *C. TRIFOLII*, CURTIS), *VERSUS*
C. MELILOTELLA, SCOTT.

BY EUSTACE R. BANKES, M.A., F.E.S.

For some time past I had been quite convinced that the records of the capture of *Coleophora Frischella* in Britain referred in reality to the species which had been more recently described as new (Entom. Weekly Intelligencer, viii, 108; Tr. Ent. Soc. Lond., n. s. v, 408, pl. xvii, fig. 1), under the name of *C. melilotella*, and I had imagined that the true continental *C. Frischella* had never occurred with us; but, while trying to work out this idea, a new conviction has forced itself upon me, namely, that *C. melilotella*, Scott, is identical with the continental *C. Frischella*, L., of which the name *trifolii*, Curtis, is already recognised as a synonym.

The first specimens captured in Britain were taken by Mr. J. C. Dale, at Charmouth, and the Isle of Portland, "on trefoil flowers," on July 11th and 14th, 1831, and were described and figured by Curtis in his "British Entomology," folio 391, under the name of *Coleophora trifolii*. Mr. C. W. Dale, of Glanville's Wootton, still has in his collection the specimens captured by his father, and, on examining these, we found them to be absolutely identical with the insect now known as *C. melilotella*, which occurs plentifully amongst its food-plant, *Melilotus officinalis*, both at Charmouth and Portland. A third locality, viz., the Isle of Wight, is given in Stainton's "Manual," and there also *C. melilotella* and its food-plant occur freely.

The localities given by Stephens in his "Illustrations," Haust. iv, p. 284 (published in 1834), are Ripley and Hertford, and his words are: "Taken rather plentifully on the flowers of the trefoil in July, 1827, at Ripley; I have since captured it at Hertford."

Perhaps, to some people, the words "*on the flowers of the trefoil*," used by both Dale and Stephens, may at first sight present a difficulty, because *C. melilotella* always frequents the flowers of *the melilot*, which, in recent botanical works, is not classed as a trefoil. But in the older works we find that the melilot is invariably placed in the genus *Trifolium*, as the following extracts will show:—

Linnæus, in the "Systema Naturæ," Holmiæ 1767, tom ii, 501, gives as his classification:

Trifolium.

1st Division. *Meliloti leguminibus nudis polyspermis.*

4. (i. e., 4th species) *Melilotus officinalis.*

Sir James Henry Smith also, in "The English Flora," 2nd edition, vol. iii, p. 297 (published 1829), has

366. *Trifolium.* Trefoil, clover, and melilot.

1. *T. officinale.* Common melilot.

T. officinale, Fl. Br., 781; Engl. Bot., v. 19, t. 1340; Willd., v. 3, 1355; Hook. Scot., 217.

T. melilotus-officinalis, Linn., Sp. Pl., 1078; Huds., 323; Mart., Rust., t. 72; Fl. Dan., t. 934; Sincl., ed. 2, 393; Bull. Fr., t. 255.

T. odoratum, seu *Melilotus fruticosa lutea vulgaris vel officinarum*, Moris., v. 2, 161, sect. 2, t. 16, f. 2.

T. odoratum, sive *Melilotus*, Dod. pempt., 567, f.

Melilotus vulgaris, Raii syn., 331.

And, again, Curtis himself, in his "British Entomology," figures the melilot on the plate of one of the *Hymenoptera*, pl. 261, and says of it, "The plant is *Trifolium* (*Melilotus*) *officinale* (Melilot trefoil)."

It is quite clear then that *Melilotus officinalis* was formerly considered to be a *Trifolium*, and though the term "*trefoil*" is certainly rather vague, it could, half a century ago, be applied with strict accuracy to the *melilot*.

As I had been told in several quarters that Mr. F. Bond had taken the true *C. Frischella* in the Isle of Wight, and possessed cases of the larva, I wrote to him on the subject, and his reply was: "I regret very much that I cannot give you any satisfactory account of *C. Frischella*; I never took the insect myself, but the specimens I have were taken in the Isle of Wight by Peter Bouchard, who was then employed by Mr. E. Shepherd, and were given me by Mr. Shepherd with two cases. I understood at the time that the larvæ were found upon clover, or some kind of trefoil. The cases are very different from those of *C. melilotella*, and are much more like those of *C. conspicuella*, but rather longer and more curved. I think my specimens were taken about 25 years ago near Freshwater."

These cases in Mr. Bond's collection are also referred to in Ent. Ann., 1861, p. 88 (quoted in Ent. Mo. Mag., xxii, 97), as "long, curved, and black, being formed of silk: it resembles most the case of the larva of *C. conspicuella*;" whereas, "the case of the larva of *melilotella* is made of the seed-husk of the *Melilotus officinalis*; at first only a single seed is used, then two are clumsily attached together, ultimately they are so blended as to form a symmetrical cylindrical case."

For a time I was certainly puzzled by the very marked differences, as given above, in the shape and composition of the cases of the two species; but on hearing from Mr. Bond that he could give no really satisfactory account of the cases in his collection, which, it must be remembered, are *the only so-called Frischella cases in existence*, I was naturally led to think that there had probably been some mistake made about them, or some accidental transposition of cases, and that these *conspicuenta*-like cases might, perhaps, after all, be veritable cases of *C. conspicuenta*.

To sum up the whole matter then, and bearing in mind that Mr. Dale's original specimens of *C. trifolii* (= *Frischella*) are undoubtedly the species now known as *C. melilotella*, I think it has been shown

1. that the imagines of these two (?) species are in every respect identical;
2. that the recorded localities for the insects are the same;
3. that *C. Frischella* used, previous to 1860, to frequent "rather plentifully" the flowers of "*the trefoil*;" while *C. melilotella* has, ever since 1860, when it first received its name, been found in some plenty attached to the flowers of *the melilot*, which was formerly known and classed as *a trefoil*.

Against all this we have the fact that the two cases in Mr. Bond's cabinet, which have long *been supposed* to be those of *C. Frischella*, have no resemblance whatever to the rather peculiar cases of *C. melilotella*.

After reading Mr. Bond's own account of his cases, and carefully weighing the pros and cons, the only reasonable conclusion open to us seems to be that we have here an instance of one and the same species doing duty, for more than a quarter of a century, for two distinct species under different names. The mistake may, I think, be attributed entirely to the fact that the identity of Mr. Bond's cases has, up till now, never been called in question; and we can only regret that so large an amount of time and energy has been spent in vain by so many Micro-Lepidopterists in the attempt to re-discover in its original localities the long-lost *C. Frischella*—an attempt which has almost invariably ended (and no wonder!) in the capture of the more recently described *C. melilotella*.

A word must now be added to explain the omission of any reference to foreign authors in general, and Von Heinemann's "*Schmetterlinge Deutschlands und der Schweiz*" in particular. On referring to the account given in that work (Band ii, Heft ii, s. 549,

1877) of *C. Frischella*, one is very apt to be misled, as in fact I myself was, into thinking that the matter is at once set at rest because the descriptions answer most accurately in every detail to the imago and case of *C. melilotella*; but Mr. Stainton informs me (1) that it is extremely probable that those descriptions were written not by Von Heinemann himself, but by Dr. Wocke, who completed the work after the lamented decease of Von Heinemann; and (2) that the imago and case there described were in all probability those of *C. melilotella*, to which the name *Frischella* was there given for the first time, *Frischella* not having been previously known as occurring in Germany or in Switzerland.

C. melilotella first received its name in 1860, the larvæ having been found almost simultaneously at Stockton-on-Tees by Mr. John Scott, and at Frankfort-on-the-Main by Herr Mühlig, in the previous August.

Very, very few specimens of the imago seem to have been known in Germany until Sorhagen captured some at Berlin in 1878, nor does any one in that country appear to have been successful in breeding the insect.

In conclusion, then, it seems clear that henceforth the name *melilotella* must disappear from our lists, and must, with *trifolii*, stand simply as a synonym of *Frischella*; so that for the future the synonymy will be:—

COLEOPHORA FRISCHELLA, Linnæus, Stn.

trifolii, Curtis,

melilotella, Scott.

I have just learnt from Mr. Stainton, who has kindly furnished me with all the extracts from German authors relating to this species, that Herr Anton Schmid, in his "Lepidoptera of Regensburg," which appeared in 1886, has already assigned *melilotella*, Scott, as a synonym to *Frischella*, L., though he does not give any reasons for so doing.

The Rectory, Corfe Castle :

April 20th, 1888.

P.S.—Since the above notes were written, Mr. F. Bond has most obligingly lent me one of the two reputed cases of *C. Frischella*, which were given him by Mr. E. Shepherd, and, after making a most minute and careful examination of it, I must honestly confess that I have failed to trace the slightest difference whatever between it and the cases of *C. conspicuella* in my cabinet, and I have not the slightest doubt in my own mind that it really belongs to that species. The

distinctions relied on by Mr. Bond are that it is *longer* and *more curved* than the case of *C. conspicuella*, but I find, on the contrary, that it is *exactly the same length* (7") as my longest *conspicuella* cases, whilst it is *not so much curved* as some of my cases of that species. Seeing that Mr. Shepherd took neither the moths nor the cases himself, it seems quite possible that he may have wrongly connected in his mind the cases of *C. conspicuella* with the imagines of *C. Frischella*, and have been under that false impression when he gave the insects and cases to Mr. Bond. As Mr. Bond's cases have for a long time been the only obstacles to the union of the old *trifolii* with the modern *melilotella*, I think it will be admitted that the question of *C. Frischella*, L. (*trifolii*, Curtis), *versus* *C. melilotella*, Scott, has now been satisfactorily settled.—*May 2nd*, 1888.

CONCERNING SOME OF HAWORTH'S TYPES OF BRITISH
MICRO-LEPIDOPTERA.

BY WILLIAM WARREN, F.E.S.

While lately looking over the types of Haworth's insects in the British Museum, I made three discoveries, which are, I think, worth recording. I must explain that each insect bears on its pin a small browned ticket, with Haworth's own name, in, I presume, his own hand-writing. In cases where Haworth's names have had to give place to older ones, a large blue paper label is pinned underneath the specimens. The names on these larger labels, as well as the notice at the top of the drawer, that these types were presented to the British Museum by the Entomological Society, are in the hand-writing, so Mr. Waterhouse tells me, of the late Mr. F. Smith. This gentleman, not being a Lepidopterist, cannot be held accountable for the mistakes which occur, in several instances, in the application of the names, and the errors in the spelling are probably due to illegibility in the original labels which Mr. Smith copied: *e. g.*, we find *frillatana* for *frutetana*, *affractana* for *effractana*.

Now, above the ticket marked *splendidulana* are two insects, each with the smaller brown label in Haworth's own writing. The left-hand one is marked *strobilana*, and is what we now are accustomed to call *splendidulana*; the other is named *fraternana*, and is an unmistakeable example of *distinctana*, Wilk., = *proximana*, H.-S. The specimen is a ♂, with the costal fold distinct, though in other respects not in particularly good condition. Haworth himself, p. 449, Lep.

Brit., refers to Hübner's fig. 70 of *Tortrix strobilana* as his *fraternana*, but I must confess that to me the figure is unrecognisable. The reference, however, probably misled Stephens, for he, Ill., iv, p. 98, quotes Haworth's Latin diagnosis of *fraternana*, and then proceeds to give another of his own in English, which last applies certainly to *splendidulana*, Gn., but which Haworth himself called *strobilana*. It will be noticed that Haworth compares his *fraternana* with the preceding species, his *subsequana*, = *abiegana*, Dup., and there is certainly more resemblance between these insects than between *splendidulana* and *subsequana*. He also says, "*Habitat cum præcedentibus*," and gives "April" with a query. Now, both *subsequana* and *splendidulana* occur together in May, which is, I believe, also the proper month for *proximana*, H.-S. At all events, there can be no doubt that Haworth's name must have the priority, and the synonymy will, therefore, be:—

fraternana, Haw., Lep. Brit., p. 449, No. 174.

proximana, H.-S., fig. 127, iv, p. 219; Hein., p. 165.

distinctana, Wilk., p. 111; Stn., 2, 216.

The next discovery is still more interesting. An example of *Teleia humeralis*, Z., beneath which stands the larger label, "*lucullella*" (*sic*), bears Haworth's own label, with the name *decorella* on it. For some time I was puzzled, as this name does not occur in Haworth's Lepidoptera Britannica, but it is quoted as *T. decorella*, Haw., in the Ill., iv, p. 213, by Stephens, who includes it in his genus *Anacampsis*. I have since found it along with notices of a few other, then new, species, in the Transactions of the old Ent. Soc. of London, for the year 1812, pp. 332—340, the paper containing the account having been read by Haworth on the 2nd of June of that same year.

In Hagen's "Bibliotheca Entomologica," p. 350, it appears that the 4th and last part of Haworth's work was printed in 1812, but not published before 1828 or 1829; the MSS. having, as Haworth himself informs us at p. 333 of the Transactions above noticed, passed into the hands of a Mr. W. Savage, with whom the publication rested. Hence, we have the curious anomaly of the names of species contained in what might be considered as an Appendix* to a work, preceding by 16 years those contained in the work itself. (The fact was recognised by Wocke in his catalogue: as he makes *tricolorella*, Haw., which appears in the paper in the Transactions, precede *contigua*, Haw., which comes in the body of the work.)

* Haworth, in 1812, contemplated writing an Appendix to his Lepidoptera Britannica but never did so.—H. T. S.

The synonymy will, therefore, be:—

Tinea decorella, Haw., Trans. Ent. Soc. Lond., 1812, p. 338.

Gelechia humeralis, Zell., Isis., 1839, p. 200; Stn., I. B., 119, Man., 2, 336; H.-S., v., p. 170, fig. 477, 478; Frey, Lep., 120.

Anacampsis Lyellella (Curt., MSS.), Humph. and West., Brit. Moths, vol. ii, p. 190, pl. 106, fig. 10.

Teleia humeralis, Hein., p. 276.

Haworth's diagnosis is as follows:—" *Alis anticis capiteque niveis, costa ipsa interruptim, plagaque communi niveis.*

" *Lep. Brit. App. inedit.*

Expans. alarum, 6 lin."

As Mr. Stainton points out, this, as it stands, is nonsense; but if for the second "*niveis*" we read "*nigris*," we have an exact description of the specimen with Haworth's label to it, and which he most probably had before him. If the description stood alone, we should have no right to use the name *decorella* for the species to which, when altered, we referred it; but with the insect itself also bearing that name, I think we need have no hesitation in admitting it.

Stephens, Ill., iv, p. 213, says of his *Anacampsis decorella* (to which he wrongly quotes as synonymous, *T. decorella*, Haw.), "*Alis anticis nigro-fuscis, fascia basi alteraque postica albis, maculaque media ochracea, posticis fuscis.*" His fuller English description shows that he had before him the insect now known as *Laverna decorella*. Oddly enough, among these types of Haworth's is another *Tinea*, with a label in his writing, *subbistrigella*, but under which stands the larger label, *decorella*; showing that the author of these labels, whoever he was, could not distinguish between *Lav. decorella*, with the ochreous markings, and *Lav. subbistrigella*, which is without them.

The label marked "*lucullella*," placed beneath Haworth's *decorella*, may be explained in two ways: either it was simply a mis-spelling for "*luculella*," owing to Stephens' mention of the ochreous blotch in the middle (but this explanation I doubt: as the name *luculella* rightly spelt occurs only three places afterwards, rightly placed under Haworth's *subrosea*); or it may have been intended for *Lyellella*, which would explain the double *ll* in the 3rd syllable.

Mr. Stainton, in the I. B., p. 119, quotes *decorella*, Haw., with a query, as a synonym of *humeralis*, Z.; probably in mistrust of Stephens' confusion; he evidently has not seen this specimen with Haworth's name attached.

The last rectification also relates to a Gelechid. Under the type marked by Haworth, *Knockella*, stands on the larger label, *Aurofasciana*! How the last name crept in, I cannot attempt to explain: but the

insect, on close inspection, is seen to be a symmetrically rubbed example of *Nannodia næviferella*, the British form of Hübner's *stipella*. Haworth's description of the white along the inner margin is, of course, misleading, and refers only to this particular rubbed specimen, which was taken at Coombe Wood, and was considered unique. I see that Mr. Stainton, in the *Insecta Britannica*, p. 136, does quote *Knockella*, Haw., but with a query, as a synonym of *næviferella*. I do not think it admits of a doubt. While, therefore, Hübner's name, *stipella*, will stand for the stem form, *Knockella*, Haw., will have to supersede *næviferella*, Dup., for the variety.

One more remark, and I have done. It is generally considered that Haworth's *latifasciana* is a variety of *Schalleriana*, but in this type collection an example occurs placed along with five other varieties of *Abilgaardana* = *variegana*, which is a much more likely position for it, if it be a variety at all, than the neighbourhood of *Schalleriana*. I think it will probably turn out to be a distinct species, attached to hornbeam.

London : May, 1888.

[I fear I cannot follow Mr. Warren in accepting his corrections of nomenclature for *Gelechia humeralis* and *G. næviferella*.

With regard to the former, Haworth's description with the best intentions will not apply, because, by a misprint (or, perhaps, from a blunder in the manuscript), "*niveis*" occurs instead of "*nigris*." Mr. Warren proposes to correct this by substituting *black* for *white*, and then claims priority, as if he had done so in 1812.

It is possible that Haworth's type may throw a light on what Haworth *intended*, but it fails to alter the fact what Haworth *did*. If we have the power to adjust old descriptions to make them fit old types, we lose all fixity of our ideas.

"Captain Cuttle's" watch was a very good one, if you only put it forward half an hour every morning and a quarter of an hour every afternoon, but one would rather not have such a watch in real life.

With reference to *Gelechia næviferella*, a description which will only apply to *symmetrically rubbed* specimens fails to answer my idea of a good description, and I could not advise any one to upset a well known name, by reviving one, ignored till now, and only rendered intelligible by the careful study of the *symmetrically rubbed* specimen from which it was made.

As to Mr. Warren's corrections of synonymy amongst the *Tortrices* I say nothing, as they are not in my province.—H. T. STANTON, May 12th, 1888.]

A CONCISE GENERIC SYNOPSIS, WITH AN ANNOTATED LIST,
OF THE SPECIES OF BRITISH *EPHEMERIDÆ*.

BY REV. A. E. EATON, M.A., F.E.S.

Now that the final (6th) part of a "Revisional Monograph of Recent *Ephemeridæ* or Mayflies" has been published in the Transactions of the Linnean Society of London, 2nd series, Zoology, vol. iii, pp. 352, pls. 65 (1884—88), occasion may be taken to review the nomenclature of the British species, so far as to show in what respects it now differs from that which was adopted in the "Catalogue of British *Neuroptera*" issued in the year 1870 by the Entomological Society of London, and the "Monograph on the *Ephemeridæ*" in the Transactions of the same Society for the year 1871. In these earlier publications 37 British species, classed in ten genera, were admitted. Of those reputed species two were spurious; but the total number has been maintained by the addition of two new species to our fauna. The number of British genera has, however, been enlarged to thirteen by the sub-division of two of the former ten along lines of separation that were recognised to some extent tacitly in 1870.

- 1.—Fifth tarsal joint from the tip of the ♀ fore-leg and of the hinder-legs of both sexes either wanting or distinguishable only by contour or colour2.
Fifth tarsal joint from the tip articulate with the tibia in both sexes, and usually in all of the legs; but when it is distinguishable by contour or colour alone, this joint is long8.
- 2.—Three caudal setæ3.
Two setæ, the third aborted. ♂ eyes bi-partite; the upper segment turbinate...7.
- 3.—Four wings4.
Two wings, the hinder lacking. ♂ eyes smoothly contoured, far asunder...
Cænis.
- 4.—♂ eyes smoothly contoured5.
♂ eyes more or less ascalaphoid (indistinctly so in *Habrophlebia*) 6.
- 5.—Basal joint of ♂ forceps one of the shortest *Ephemerella*.
Basal joint of ♂ forceps much the longest *Potamanthus*.
- 6.—Basal joint of ♂ forceps much longer than the remainder. Hind-wing slightly arched in front *Leptophlebia*.
Basal joint of ♂ forceps sub-equal in length to the remainder. Hind-wing angulated in the middle of the costa ... *Habrophlebia*.
Basal joint of ♂ forceps very short; 2nd joint much the longest. Hind-wing arched in front..... *Ephemerella*.
- 7.—Hind-wings minute, moderately broad, obtuse, bi- or tri-nerved, and (as a rule) without a cross veinlet *Baëtis*.
Hind-wings minute, very narrow, binerved *Centroptilum*.
Hind-wings lacking *Cloëon*.

- 8.—Hinder tarsi equal in length to, or longer than, the tibiæ. Tarsal claws all narrow and hooked *Siphylurus*.
 Hinder tarsi shorter than the tibiæ; one claw obtuse, the other hooked in every tarsus ... 9.
- 9.—Basal joint of the fore tarsus much shorter than the next joint in both sexes... 10.
 Basal joint of the ♂ fore tarsus much shorter than the next joint; that of the ♀ fore tarsus only a little shorter than the next. Femora sometimes dark-banded, spotless. Basal joint of hind tarsus longer than, or equal in length to, the next joint 11.
- 10.—Basal joint of hind tarsus equal to the next joint. Femora usually marked with a dark median spot. Wings of sub-imago uniformly light greyish; transverse neuration rather fine *Rhithrogena*.
 Basal joint of hind tarsus shorter than the next joint. Femora either without markings, or with only very faint bands. Wings of sub-imago light yellowish, becoming striped transversely with grey before the moult; transverse neuration moderate *Heptagenia*.
- 11.—Penis lobes broadly dilated at the tip. Wings of sub-imago greyish, with rather strong transverse neuration, becoming striped transversely with dark grey before the moult Section A of *Ecdyurus*, Nos. 34—36.
 Penis lobes small, obvate. Wings of sub-imago uniformly grey, never striped; transverse neuration rather fine Section B of *Ecdyurus*, No. 37.

In the following list of the British species, the synonymy is limited to names in the Entomological Society's Catalogue of 1870 that have become obsolete, and the bibliographical references to the Monograph on the *Ephemeridæ* in Trans. Ent. Soc. Lond., and the Revisional Monograph in Trans. Linn. Soc., Lond., above mentioned. For brevity these three publications are here cited as "Cat.," "Mon.," and "Revis.," respectively; the date of publication in the Revision alone is stated in parenthesis.

1. *Ephemera vulgata*, Linné: Mon., p. 68, pl. iv, 5, 5*b* [adult details]; Revis., p. 59, pl. viii, 12*b* [adult details], and xxx [nymph] (1884).

The piceous dorsal markings of the best-marked abdominal segment comprise a large pair of acute triangular spots, pointing backwards from the base, and a shorter pair of fine lines between them also from the base.

Summer. Rivers.

2. *Ephemera danica*, Müller: Mon., 72, pl. iv, 8, 8*a* [adult details]; Revis., 61, pl. viii, 12*a* [adult details] (1884).

The dark markings of the chalky-white abdomen comprise on the dorsum of the best-marked segment a pair of moderately broad sub-lanceolate streaks, shorter than the segment, from the base, with a shorter pair of very narrow streaks between them; the markings on each side sometimes coalesce, and are either lacking entirely, or else are reduced to a single pair of triangular spots in the anterior segments.

Summer. Streams.

3. *Ephemera lineata*, Eaton: Mon., 71, pl. iv, 7, 7*b* [adult details];
Revis., 63 (1884).

The best-marked abdominal segment has six longitudinal, linear, dark dorsal stripes, shorter than the segment; of these the outer pair of stripes on each side consists of sub-sinuate stripes of almost equal length, pointed at both ends, and much longer than the median pair, which is composed of curved stripes.

Near Reading. Summer.

4. *Potamanthus luteus*, Linné: Mon., 76, pl. ii, 1, and iv, 13, 13*a* [adult details]; Revis., 79, pl. ix, 14 [adult details], and xxxi [nymph] (1884).

The sub-imago is apt to be mistaken for the common *Heptagenia sulphurea*. The forked second axillar nervure of the fore-wing, and the lobed ninth ventral segment, serve to distinguish the female insect from *Ephemera*.

Weybridge. Summer.

5. *Leptophlebia marginata*, Linné: Mon., 84, pl. ii, 2*a*, and iv, 25, 25*b* [adult details]; Revis., 93, pl. xi, 17*a* [adult details] (1884).

Wings of sub-imago grey, spotless. Penis lobes pointed, spurred beneath.

Spring and autumn.

6. *Leptophlebia submarginata*, Stephens: Revis., 94 (1884), = *L. helvipes*, Cat., p. 7; Mon., 85, pl. iv, 26, 26*d* [adult details].

Wings of sub-imago grey, pale-spotted in the midst. Penis lobes flanged transversely at the tips, spurred beneath.

Spring and summer.

7. *Leptophlebia cincta*, Retz.: Mon., 87, pl. ii, 2*c*, and iv, 27 [adult details]; Revis., 95, pl. xxxii [nymph] (1884).

Wings of sub-imago black, spotless. Anterior abdominal segments of ♂ usually transparent white. Penis lobes flanged shortly at the tips transversely, spurred beneath. The sub-imago and adult ♂ are apt to be mistaken for *Baëtis pumilus*.

Summer.

8. *Habrophlebia fusca*, Curtis: Revis., 116, pl. xiii, 22*a* [adult details], and xxxvi [nymph] (1884), = *Leptophlebia fusca*, Cat., p. 7; Mon., 90, pl. ii, 2*c*, and v, 2, 2*b* [adult details].

Summer. Small streams.

9. *Ephemerella ignita*, Poda: Mon., 98, pl. ii, 5, and v, 7, 7*a* [adult details]; Revis., 126, pl. xiv, 24*a* [adult details], and xxxvii [nymph] (1884).

Penis lobes truncate at the tip before desiccation.

Summer and autumn.

10. *Ephemerella notata*, Eaton: Revis., 305, pl. lxx, 9 [adult details] (1887).

Penis lobes pointed at the tip before desiccation.

River Eden [Cumberland] and South of Scotland.

11. *Cænis dimidiata*, Stephens: Mon., 95 (part), pl. ii, 4, and v, 5 [adult details]; Revis., 142, pl. xv, 26b [adult details] (1884).

Female abdomen chalky-white, tinged in the first five segments with greyish.

♂ genitalia whitish.

Summer.

12. *Cænis rivulorum*, Eaton: Revis., 143 (1884), and 320 (1888).

Female abdomen white, partially varied with greyish in the first three segments.

♂ genitalia whitish.

Summer.

13. *Cænis halterata*, Fabricius: Revis., 144, pl. xv, 26, 26a [adult details] and xlii, 1, 2, 7—17, and 22—25 [nymph] (1884), = *C. macrura* and *chironomiformis*, Cat., p. 8; Mon., 93 and 94, pl. v, 4 [adult details].

Female abdomen blackish-grey above, varied with ochreous towards the sides and at the joinings. ♂ sub-genital membrane broadly edged at the tip with blackish, and usually marked at the base with a median, almost semicircular, mucronate spot of the same colour.

Summer.

14. *Cænis Harrisella*, Curtis: Revis., 146 (1884), = *C. luctuosa*, Cat., p. 8; Mon., 97, pl. v, 6 [adult details]; Revis., pl. xlii, 5, 6, 18—21, 27, 28 [details of nymph] (1884).

Female abdomen warm sepia-brown, marked on each side in every joining with a short black line, and near the base of every setaceous pleural process with a pale elongate or oblong spot. ♂ sub-genital membrane pale, excepting at the sides before the forceps, and a narrow, slightly tapering streak about half its length from the middle of the base, which are dark greyish.

Summer. Near Reading.

(To be concluded in our next).

DESCRIPTION OF A NEW *NEPTICULA* FROM BEECH.

BY H. T. STANTON, F.R.S.

NEPTICULA FULGENS, *n. sp.*

Anterior-wings shining olive-green to beyond the middle, then with a very brilliant silvery fascia, rather obliquely placed; sometimes the ground colour is a little darker immediately before the fascia; the apical portion of the wing is of a rich chocolate-brown, in certain lights looking blacker and contrasting strongly with the pale grey cilia; head whitish-ochreous, darker on the vertex. Exp. al. 2½ lin.

Of this very pretty species I have seen several specimens, bred by Mr. I. H. Threlfall from beech leaves. Its most striking character is "the effulgent metallic brilliancy" (to quote the words applied by J. F. Stephens to the silver spots of *Argynnis Lathonia*) of the silvery fascia, but the glossiness of the basal portion of the wing would alone serve to distinguish it from the usual beech feeder, *N. Tityrella*, a much duller and more sober looking insect. At present the character of the mine has hardly been sufficiently distinguished.

Amongst Mr. Threlfall's specimens of this novelty was one perhaps not identical, but likewise from beech; it had the same brilliant silvery fascia, but the basal portion of the wing was more of a golden-brown, and there was a broader dark band before the fascia, and the head appeared to me black.

Professor Frey described, in 1856, in his *Tineen und Pterophoren der Schweiz*, p. 384, a *Nepticula fagi* from specimens taken (not bred), but he said he felt doubtful whether it was really a distinct species, and not rather a summer brood of *floslactella*. He adds that he saw specimens in Von Heyden's collection, which had been "bred" from beech. I think I may safely say that no one would ever be disposed to take *fulgens* for any brood of *floslactella*, and if we needed further evidence to show that Frey's *fagi* was something very different from *fulgens*, it would be found in his description of the fascia as "*lata, flava (non nitente).*"

Yet Professor Frey seems to have had specimens of *fulgens* in his possession—even though they would not, and could not agree with his description of *fagi*.

In October, 1855, I received from him a specimen with the name *fagella*, which I can now unhesitatingly refer to *fulgens*. Fortunately I never was much of a believer in types, knowing how easy it is to misplace specimens and to mix up allied species, or the inspection of this specimen would have puzzled me.

As it is, I can only assume that the description of *fagi* was made from certain caught *Nepticulæ*, and that other specimens were afterwards placed with them which were not really identical, and that one of these with the name *fagella* came to me.

Mountsfield, Lewisham, S.E. :

May 16th, 1888.

DESCRIPTION OF THE LARVA OF *EUCLIDIA MI*.

BY GEO. T. PORRITT, F.L.S.

A moth of this species, taken June 5th, 1886, at the Green Farm Wood, Doncaster, deposited eggs which were globular in shape, the colour a dull pale green. They hatched about the 28th of the same month, and the young larvæ were dingy green with large yellowish-brown head; when walking they looped the back in the same way as does a Geometer, and when disturbed at once rolled themselves up and feigned death. They fed well on grass and common white clover, and by July 22nd were slender creatures of about five-eighths of an inch long,

with only six ventral legs, and, consequently, were veritable "loopers," arching the back as much as any Geometer. On August 7th, when almost an inch long, I described them as follows:—

Very slender: head wider and deeper than the second segment, the lobes evenly rounded; body of nearly uniform width throughout, rounded above, slightly flattened ventrally; skin smooth, the segmental divisions clearly defined, but not deeply cut; there are only three pairs of ventral legs, on the 9th, 10th, and 13th segments respectively, the last pair, when at rest, being stretched backwards and outwards, give the appearance of a notched anal prominence. Ground-colour generally dingy pale olive-green, in some specimens, however, bright greenish-yellow; on it is a pretty ornamentation of chocolate-brown stripes as follows:—First, a narrow and interrupted medio-dorsal, then a double and more clearly defined one, followed below at about the same distance by another double stripe, then follows a broader one, and immediately adjoining it is the broad and conspicuous lemon-coloured spiracular stripe; all these stripes extend in strong relief through the head. The ventral surface has a somewhat similar but not so clearly defined ornamentation; the ground-colour being as on the dorsal area, and having a central, then a double, followed by another double line, all of chocolate-brown.

The habits, perfect manner of looping the back when walking, feeding, and everything else are exactly as in a Geometer; and were it not for the additional pair of ventral legs, it would be impossible to separate it from a Geometer.

The adult larva I described on September 6th as follows:—

Length, about one and a half inches, and, although still rather slender, is considerably stouter in proportion than when last described; head larger and slightly wider than the second segment; body cylindrical above, a little flatter ventrally; it is of nearly uniform width to the 9th segment, but this and the 10th are a little wider, from the 10th it tapers more strongly to the anal extremity; skin smooth, the segmental divisions clearly defined but not deeply cut, and there is a very slight rather puckered ridge along the spiracular region; there are only three pairs of ventral legs, on the 9th, 10th, and 13th segments respectively, the last pair, when at rest, are stretched backwards and outwards, and give the appearance of being a notched anal prominence. Ground-colour bright lemon-yellow, some specimens having an ochreous tinge: the same pretty ornamentation of stripes still remains, as follows:—First, a fine double and rather irregular pale chocolate-coloured medio-dorsal, followed by two broader and darker chocolate, then two more equally broad ones of the paler chocolate, followed by a narrow one of a darker shade of the same colour, and closely followed by a still darker one immediately edging the pale, bright, lemon-yellow, broad, spiracular stripe; these stripes extend in strong relief through the head down to the mandibles, and the whole ornamentation, taken with the ground-colour, forms a series of alternately chocolate-brown and lemon-yellow stripes. The ventral area is less distinctly marked than when last described: the ground is greyish-yellow in the centre, rust-colour at the sides, with double interrupted chocolate central stripe; at the sides are two other similarly coloured stripes, the

outer edge of the last being close to the broad spiracular stripe; legs and prolegs greyish-yellow, the latter marked on the outside with rust-colour.

Manner of feeding, walking, &c., just as when last described. The last two larvæ went down September 21st, but no imagines afterwards emerged from any of them.

Huddersfield :

May 9th, 1888.

Note on Argyrolepia zephyrana, Tr.—On reading Mr. Barrett's account of *A. maritimana* and this species (Ent. Mo. Mag., xxiv, p. 219), it occurred to me that the confusion between them may have arisen from the fact that there are two forms of *zephyrana*. One of these is the small grizzled insect with the ground colour of the fore-wings very pale yellowish-white, and their whole surface thickly sprinkled with dark brown scales which greatly obscure the distinctness of the fasciæ. This form seems everywhere common in chalky and shingly places; the other form has the fore-wings of a rather bright primrose-yellow, with the fasciæ in some instances almost obsolete, except a small dark spot on the costa near the apex, while the dark scales are but slightly represented. Its size has, to my knowledge, sometimes led to its being taken for *A. maritimana*, my largest specimen of which measures about 19 mm. from tip to tip, while my largest *A. zephyrana* extends about 16 mm., fully as much as average-sized specimens of its ally. I have only met with the larvæ of this large form of *A. zephyrana* in a gross variety of *Daucus carota* growing on a crumbly, and no doubt in winter very muddy, cliff in the Isle of Wight. I may, perhaps, be allowed to mention that, in addition to the characters pointed out by Mr. Barrett, the fringes of *A. maritimana* are streaked with dark brown, while those of *A. zephyrana* are entirely pale yellow.—W. H. B. FLETCHER, Fairlawn House, Worthing: April 16th, 1888.

On the food plant of Thecla rubi, L.—Mr. Barrett's remarks on this species (Ent. Mo. Mag., xxiii, p. 197), in his interesting account of his visit to Cannock Chase, lead me, though rather late in the day, to record the circumstances of my first meeting with its larva. In the summer of 1884, Mr. Salvage sent me from Rannoch a bag of shoots of *Vaccinium vitis-idaea* on which larvæ of *Euchromia arbutana* were feeding. After a while some *Lycæna*-like larvæ crawled up. On writing to ask Mr. Salvage what species of that genus occurred among the plant, he told me that *Thecla rubi* was common where the shoots were picked, and that he had most likely sent me its larva by accident. This was duly confirmed by the appearance of some butterflies the following spring. A parallel case of a British butterfly feeding on plants of both the Natural Orders *Leguminosæ* and *Ericaceæ*, is afforded by the larvæ of *Lycæna Agestis*, which the late Mr. Buckler once told me is taken from *Calluna vulgaris* on the Continent, while he himself reared it on *Ornithopus perpusillus*. Mr. Barrett once obtained eggs laid on "twigs of heather," and I also once found the larvæ on Ling in the New Forest, so that I am inclined to think that this is the usual food plant of the insect.—ID.

Occurrence in Sussex of Butalis laminella, H.-S., new to Britain.—Among some specimens of *B. fuscocuprea* swept in Arundel Park, in July, 1886, were a few others of

an indistinct bronzy-green, somewhat like *B. fuscoænea* in colour, but darker and also much smaller; they measure, indeed, a trifle less than *B. senescens* and *fuscocuprea*. Last year I had the luck to find the larva on *Helianthemum vulgare*, and to breed a few moths. Mr. Stainton most kindly examined some of these and has referred them to *B. laminella*, H.-S. This species may be separated from the purplish-black *B. fuscocuprea* by its colour, and from *B. senescens* by the entire absence of pale scales from the fore-wings. I believe that the females of both these species have large white blotches on the under-side of the abdomen, while those of *B. laminella* have a small yellowish one. The larva of the latter is also very distinct, as will be seen from the description which Mr. Bankes has been good enough to furnish.—
ID.: April 13th, 1888.

Description of the larva of Butalis laminella, H.-S.—Knowing that I was much interested in the genus *Butalis*, Mr. W. H. B. Fletcher, of Worthing, was good enough to send me, on June 7th, 1887, some larvæ which he had found feeding on *Helianthemum vulgare* in Arundel Park. At the time we both imagined that they would produce *B. fuscoænea*, but the perfect insects bred from them have now proved to be the closely-allied *B. laminella*, H.-S., which will, I expect, be found to be pretty widely distributed, though hitherto always confused with the former species. The following description of the larva was taken on June 8th:—Length, $4\frac{1}{2}$ lines. Head slightly narrower than the second segment: both it and the second segment are dirty yellow, and polished, with one or two small blackish spots on the sides. Body long, thin, and cylindrical, dull, dark olive-brown with a greenish tinge, hardly showing at all paler between the segments, but of rather a lighter shade towards the anal segment, which has no darker horny plate. The skin is rough like shagreen, emitting a few light bristles. No apparent dorsal or subdorsal lines or spots; but there is a whitish-yellow stripe along each side below the spiracles. Ventral surface dark reddish-brown, inclining to dark chestnut, and showing greenish-yellow between the segments. Anterior legs black. Living in a loose silken web among the stems of its food-plant, *Helianthemum vulgare*. The first imago appeared on July 2nd; and fortunately the species does not seem to be so exceedingly difficult to rear as are several others of the genus.—E. R. BANKES, The Rectory, Corfe Castle: March 20th, 1888.

Mytilaspis pomorum.—Mr. James O'Brien has sent to me an apple just imported from Tasmania on which were a dozen of the scales of this Coccid, and he says he has seen some on apples from Australia. Mr. Maskell reports it as common on many trees in New Zealand, and Professors Riley and Comstock state that it abounds on many different trees in N. America, more commonly in the Northern States. It is universal in Europe, and in this country it occurs on many trees; I have lately seen it on the stems of heather (*Calluna*), and hoped I had found *M. linearis*, which Signoret reports he had seen on heath (*Erica*), but it proved to be only *M. pomorum*. I have seen the scales of this species on the fruit of apples grown in Britain, yet rarely, and also on American and Canadian fruit; usually they are attached to shoots two years' old, but they are also seen in full vigour on the hard, dry bark of old stems, and then they must derive their nutriment by means of their long rostral setæ inserted through the stomata down to the liber; and they are very hurtful to the trees. I am in quest of other species of *Mytilaspis* which should occur in Britain:—*abietis*, Schrank, on branches of spruce-fir; *buxi*, Bouché, on the

under-side of leaves of box: *conchiformis*, Gmel., on branches of elm; *juglandis*, Fitch, on walnut; and *linearis*, Geoffr., on lime; and I should be very much obliged to any one who would send me *in situ* any scales found on these trees, hoping that they may prove to the desired species. All the scales of this genus may be easily recognised by their long, narrow, mussel-shaped form; outwardly they are much alike, the distinctive specific characters being minute.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: May 12th, 1888.

On a collection of Ants from Gibraltar and Tangier.—Mr. J. J. Walker has been kind enough to collect Ants for me during his stay at Gibraltar, and I have pleasure in giving here a list of the species that he has so far been able to secure. The two species which appear to me to be of chief interest are the curious *Anochetus Ghilianii*, of which he has met with numerous examples, both at Gibraltar and Tangier, and the rarer *Amplypone denticulata*, of which he has sent two ♂ individuals, one from Gibraltar and one from Tangier. Of *A. Ghilianii*, Mr. Walker says, writing from Gibraltar, "The curious hook-jawed creature (*Anochetus Ghilianii*) is quite plentiful at Tangier under stones, and I have lately found it here not rarely, it is no use though as a host for beetles, by far the best one in that respect being the long, active, black, pubescent species named for me by Mr. Lewis, *Aphænogaster testaceopilosa*, Lucas." It is curious that amongst the numbers of specimens sent there should be no representative of either of our larger British genera of *Heterogyna*, viz., *Formica* and *Myrmica*.

The following is a list of Mr. Walker's captures:—

Camponotus sylvaticus, Oliv., ♀, Gibraltar and Tangier; *marginatus*, Ltr., ♂, Gibraltar; *cruciatatus*, Ltr., ♀ ♀, Tangier; *micans*, Nyl., ♀, Tangier. *Tapinoma erraticum*, Ltr., ♀ ♀, Gibraltar. *Plagiolepis pygmaea*, Ltr., ♀ ♀, Gibraltar. *Anochetus Ghilianii*, Spin., ♀, Gibraltar and Tangier. *Amplypone denticulatum*, Rog., ♀, Gibraltar and Tangier. *Ponera punctatissima*, Rog., ♀, Gibraltar, one specimen; *ochracea*, Mayr (very dark), ♀ ♀, Gibraltar. *Tetramorium cæspitum*, Linn., ♀, Gibraltar. *Monomorium subopacum*, Sm., ♀, Gibraltar; *minutum*, Mayr, ♀, Gibraltar. *Leptothorax Rottenbergi*, Em., ♀, Gibraltar. *Aphænogaster barbara*, Linn., ♀ ♀, Gibraltar and Tangier; *testaceopilosa*, Luc., ♂ ♀ ♀, Gibraltar; *sardoa*, Mayr, ♀ ♀, Tangier; *subterranea*, Ltr., ♀, Gibraltar. *Pheidole megacephala*, Fab., ♀ ♀, Gibraltar and Tangier. *Cremastogaster scutellaris*, Oliv., ♀, Gibraltar; *sordidula*, Nyl., ♀, Gibraltar.

Mr. Walker says that all he has sent are underground species, with the exception of *Cremastogaster*, which inhabits old trees.—EDWARD SAUNDERS, St. Ann's, Mount Hermon, Woking: May 10th, 1888.

Mecinus circulatus, &c., in the Isle of Wight.—During a short stay in the Isle of Wight in the latter half of April I found *Mecinus circulatus* not uncommonly on *Plantago* near Sandown; very few other weevils were stirring, and all insects seemed scarce, with the exception of ants under stones, and an *Andrena* on the cliffs. At Ventnor I found several specimens of *Medon pocifer* (*Lithocharis maritima*), the species being commoner than I have known it for some years, and one example of *Trechus lapidosus*, which I have not seen alive for a long time. *Micralymma*, *Phytosus spinifer* and *balticus*, *Diglossa mersa* and *Dromius vectensis* only occurred by single specimens. At Sandown Mr. Gorham obtained a specimen of *Trichonyx Maerkeli*, but we failed to find another.—W. W. FOWLER, Lincoln: May 16th, 1888.

Coleoptera at Armagh.—This year has opened most auspiciously for me, and I have been able to add several species to my Armagh list, some of which are also new to the Irish list. I have been very much favoured by the weather, which has been much less severe here than in England, and consequently interfered very little with collecting.

The following are additions to the Armagh list:—*Notiophilus quadripunctatus*, *N. substriatus*, *N. palustris*, *Calathus flavipes*, *Dromius quadrinotatus* (new to Irish list), *Bembidium biguttatum*, *Hydroporus memnonius*, *H. incognitus*, *Falagria obscura*, *Hypocyrtus ovulum*, Heer (*pygmæus*, Kr.), *Mycetoporus splendidus* (all three new to Irish list), *Conosoma pubescens*, *Acidota crenata*, *Lathrobium longulum*, *Trogophlæus bilineatus*, *Lathrimæum unicolor*, *Proteinus brevicollis*, *Hister carbonarius*, *Mantura chrysanthemi*, *Thyamis brunnea*, *Rhizophagus dispar*, *Choleva spadicea*, *Cassida viridis*, *Apion minimum*, *Ceuthorhynchus sulcicollis*, *Anthonomus Chevrolati*. My chief captures besides the above were:—*Bembidium Clarkii*, *Anchomenus gracilis*, *A. viduus*, *A. piceus*, *Dromius meridionalis*, *Agabus unguicularis*, *Cælambus quinquelineatus*, *Philonthus succicola*, *Quedius semianæus*, *Lathrobium quadratum*, *Silpha sinuata*, *Scymnus Mulsanti*, *Choleva morio*, *Rhinosimus ruficollis*, *Anaspis frontalis*, *Coccinella 14-guttata*, *C. oblitterata*, and *Orobitis cyaneus*. This last I took on the top of the Vicar's Cairn in moss; unfortunately there was only one specimen. Nearly all of these were taken in moss, which is always most productive here. As regards *Cælambus quinquelineatus*, I find that it is most plentiful here, while *C. versicolor* has not occurred at all here as yet. I had mistaken light specimens of *C. quinquelineatus* for it.—W. F. JOHNSON, Winder Terrace, Armagh: April 11th, 1888.

Megaconus cingulatus at Armagh.—On May 4th I took a specimen of the above in the Mullinure Meadows, by shaking moss. The only other Irish record appears to be from Rathkurby, Co. Waterford; so its appearance here is interesting.—ID.: May 9th, 1888.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: April 26th, 1888.—T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Messrs. J. E. Pearce and J. Pearce were elected Members.

Mr. Adye exhibited *Asphalia ridens*, Fb., and varieties of *Taniocampa munda*, Esp. Mr. Lea, small specimens of *Hybernia leucophæaria*, Schiff., taken this year at Richmond. Mr. Dobson, a specimen of *Smerinthus tilia*, L., with the lower part of the central band of the superior wings absent. Mr. Dennis, three streaked varieties of *Spilosoma lubricipeda*, Esp., and a similar variety of *S. menthastri*, Esp., taken in his garden at Kingsland. Mr. T. R. Billups, a living specimen of the genus *Pelopaus*, from Honduras; also a species of *Blattidae*, *Paratropes elegans*, from South America. Mr. J. Jenner Weir read a communication from Mr. T. D. A. Cockerell, referring to his note on the origin of *Gonepteryx Cleopatra* and *G. rhamni*, read at the Meeting on March 8th last, Mr. Cockerell being of opinion that *G. Cleopatra* and *G. rhamni* were climatic forms of one species. Mr. Weir said, seeing that *G. Cleopatra* and *G. rhamni* existed over a large part of Europe in the same districts, and had a synchronous appearance in the latter part of the summer, and again after hibernation in the spring, he was unable to accept Mr. Cockerell's ingenious

theory of the origin of the two species. Mr. J. W. Slater read a paper, "Sanitary and Anti-Sanitary Services of Nature."

May 10th.—THE PRESIDENT in the Chair.

Mr. W. Martin was elected a Member.

Mr. R. Adkin exhibited full-fed larvæ of *Ephestia Kühniella*. Mr. Cooper said he had taken this moth very freely in a bakery at Leytonstone, and had found the larvæ feeding in great numbers; there was very little flour stored in the bakery, but the larvæ fed on the dust collected on the beams; he had taken the species for the last four years. Mr. Billups exhibited living examples of *Hydaticus seminiger*, De G.

The remainder of the evening was devoted to an Exhibition of Microscopical Objects, many members of the South London Microscopical Society assisting.—H. W. BARKER, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON: May 2nd, 1888.—Dr. D. SHARP, F.L.S., President, in the Chair.

Major J. W. Yerbury, R.A., of the Army and Navy Club, Pall Mall, S.W.; and Mr. P. W. Mackinnon, of Masuri, Western Himalayas, India, were elected Fellows.

Dr. Philip Brooke Mason exhibited an hermaphrodite specimen of *Saturnia carpini* from Lincoln, and another specimen of the same species with five wings, bred at Tenby.

Mr. Jacoby exhibited ♀ specimens of *Chrysomela japonica*, collected by Mr. J. H. Leech, in Japan, and called attention to a sexual structure.

Mr. Adkin exhibited a variety of *Eubolia bipunctaria*, taken at Box Hill, in July, 1886.

Mr. W. F. Kirby exhibited, for Dr. Livett, a curious discoloured female specimen of *Ornithoptera Minos*, Cramer.

Mr. W. Denison-Roebuck sent for exhibition a number of specimens of an exotic species of Bee obtained by the Rev. W. Fowler, of Liversedge, from split logwood. The cells or pouches were very irregular and rough and altogether unlike those in the "comb" of any known British species.

Dr. J. W. Ellis read a paper entitled "Remarks on the British specimens of the (so-called) *Aphodius melanostictus*, Schmidt;" and he exhibited a number of specimens and drawings of this species and of *Aphodius inquinatus*, F. A discussion ensued, in which Dr. P. B. Mason, Dr. Sharp, Mr. Champion and Dr. Ellis took part.

Mr. E. Meyrick communicated a paper "On the Pyralidina of the Hawaiian Islands," the materials for which paper consisted principally of the collection of *Lepidoptera Heterocera* formed by the Rev. T. Blackburn during six years' residence in the Hawaiian Islands. Mr. Meyrick pointed out that the exceptional position of these islands renders an accurate knowledge of their fauna a subject of great interest. He stated that of the fifty-six known species of Hawaiian *Pyralidina* nine had probably been introduced through the agency of man in recent times; but he believed the remaining forty-seven to be wholly endemic; of these latter the author referred twenty-six species to the *Botyridæ*, twelve to the *Scopariadæ*, four to the *Pterophoridæ*, three to the *Crambidæ*, and two to the *Phycitidæ*. Dr. Sharp, Mr. McLachlan, Dr. Mason, and Mr. E. B. Poulton took part in the discussion which ensued.—H. Goss, *Hon. Secretary*.

LIST OF BRITISH *TIPULIDÆ*, &c. ("DADDY-LONGLEGS"),
WITH NOTES.

BY G. H. VERRALL, F.E.S.

(Continued from vol. xxiv, page 112).

Dolichopeza sylvicola, Curt.: I believe this curious and elegant insect occurs all over Great Britain, in suitable spots; I have met with it as far north as Tongue, and also in Wales, the Lake District, Hampshire, and Sussex. It occurs on damp overhanging banks when in shade, or on the tops of water tunnels, where it may often be seen hanging by two legs only. It is an interesting study as to what the "protection" is, that is afforded by the pure white feet, a character which in some modification seems to occur in most (if not all) the allied species. The only suggestion I can make is that the insect having smoke-coloured wings and body, is practically invisible in the gloomy spots in which it flies, while the widely outstretched white feet leave six evident streaks, at which any insect-eating bird might snap, and then the legs being most wonderfully fragile, the insect itself would escape with the loss of a foot; against this I must admit that I have never seen a mutilated specimen. The adhesion of the legs is so slight that the insect requires pinning within a minute of death, if any legs are to remain on it.

Nephrotoma dorsalis, Mg.: I know only from specimens in the British Museum. Osten-Sacken would sink the genus in *Pachyrrhina*, from which it differs only in having more joints to the antennæ.

PACHYRRHINA.

- 1 (4) Abdomen black, with entire yellow bands.
- 2 (3) Thorax almost black, the black streaks coalescing so that the orange appears only in spots; abdomen with four bands *crocata*, L.
- 3 (2) Thorax yellow, with three separated black streaks; abdomen with more than five bands *imperialis*, Mg.
- 4 (1) Abdomen yellow, usually with a dark dorsal line, often interrupted.
- 5 (18) Abdomen with a dorsal line.
- 6 (11) Stigma faint, brownish-yellow or pale brown.
- 7 (8) Side streaks on disc of thorax straight at front end.. *scurra*, Mg.
- 8 (7) Side streaks on disc of thorax curved outwards at front end.
- 9 (10) Pleura before halteres blackish-brown on three sides *maculosa*, Mg.
- 10 (9) Pleura before halteres with a blackish-brown spot on under-side only...
..... *histrion*, F.
- 11 (6) Stigma blackish-brown.
- 12 (13) Hinder cross-vein, and the last piece of the vein below it, infuscated...
..... *quadrifaria*, Mg.
- 13 (12) Hinder cross-vein, and the vein below, not infuscated.

- 14 (15) Pleuræ with reddish-brown markings *analys*, Schum.
 15 (14) Pleuræ with blackish markings.
 16 (17) Occipital black spot elongate *guestfalica*, Westh.
 17 (16) Occipital black spot nearly equilateral, the two sides being scarcely longer
 than the base..... *cornicina*, L.
 18 (5) Abdomen without any dorsal line *annulicornis*, Mg.

P. imperialis, Mg.: an elegant species, which I have taken in this house in April, and not uncommonly at the end of August near Tunbridge Wells; Mr. G. C. Bignell has taken it near Plymouth.

P. scurra, Mg.: tolerably common in August about Barton in Suffolk; it is very distinct from the other *Pachyrrhinæ*, though very like *Nephrotoma dorsalis*, from which the different antennæ distinguish it.

P. maculosa, Mg.: this species was mixed up with the next by Walker, but is a perfectly distinct, darker insect. It is not uncommon about road-sides.

P. histrio, F., is very abundant in my garden.

P. quadrifaria, Mg.: not uncommon, and very widely distributed in England, but I have not seen it from Scotland. Though this and the next three species seem very much alike from descriptions, they are quite distinct species, with numerous constant small characters, which would take up too much space for this paper.

P. analis, Schum.: I have one very fine specimen from Lyndhurst, June 18th, 1885; it is the only recorded British specimen. The species is a little smaller than *P. quadrifaria*, but larger than the next two.

P. guestfalica, Westh.: this was first distinguished by Westhoff, in J.-B., Zool. Sect. Westf. Ver., viii, 51 (1879), and is there well described and figured. It appears to be a garden species, and is fairly common in my garden, but not so abundant as *P. histrio*. It is the smallest British species, the abdomen being shorter and thicker than in *P. cornicina*, L. The earliest date I have for it is Dickleburgh, June 26th, and the latest, Lyndhurst, July 14th.

P. cornicina, L., often described as *P. iridicolor*, Schum., occurs in various places near here, but never in company with *P. guestfalica*.

It is not at all improbable that two or three more *Pachyrrhinæ* may occur in England, the most probable being *P. pratensis*, L., which is one of the commonest European species; it is well distinguished by the yellow or whitish side-spots on the abdomen.

TIPULA.

Most reluctantly do I attempt any table of this genus at present ; in fact, when I began this paper, I had made up my mind not to give one, but I have come to the conclusion that, in the present state of knowledge in England, an imperfect table is better than no table at all, especially as I hope a few Lepidopterists may be induced to take up these large insects, which cannot be nearly so difficult to manipulate as the *Pterophoridae*.

- 1 (40) Wings marmorated, spotted or streaked (always with something more than a pale longitudinal streak under the costa, or a pale spot or diagonal band just before the stigma), rarely the only distinct evidence of the mottling is an indistinct pale spot near the middle of the lower basal cell.
- 2 (3) Three large brown spots against the costa, almost united on the margin, and occupying the whole length of the wing (very large species)...
gigantea, Schrk.
- 3 (2) The costa not occupied with three large conspicuous brown spots.
- 4 (5) A dark blotch in the middle, between the postical and anal veins ; the wings indistinctly clouded, grey in ♂, brownish-yellow in ♀ ...
lutescens, F.
- 5 (4) No dark blotch between the postical and anal veins.
- 6 (35) Disc of the wing marmorated, spotted or clouded, *not* streaked.
- 7 (12) Thorax with three brown stripes, which sometimes have a darker margin, and of which the middle one is often divided by a dark line.
- 8 (9) Thoracic stripes so broad that they occupy almost all the thorax, their margins not darker (the pale markings on the wing really make a medial streak from base to tip) *vittata*, Mg.
- 9 (8) Thoracic stripes moderately broad, and with dark margins, the middle stripe divided by a darker line.
- 10 (11) Wings distinctly marmorated in brownish and white ... *truncorum*, Mg.
- 11 (10) Wings almost wholly pale brown, only faintly with pale spots' ..
pabulina, Mg.
- 12 (7) Wings with four brown or brownish stripes, which are frequently margined with darker lines.
- 13 (18) The stripes on the thorax very little darker than the ground-colour, but with brown margins ; (*vide* also *T. rufina*, Mg., distinguished by the dark streak on the pleuræ).
- 14 (15) The inner brown margins of the two middle thoracic stripes so near together that they almost make a single thick line ; antennal joints of the male deeply incised *excisa*, Schum.
- 15 (14) The two middle thoracic stripes at any rate divided in the middle ; antennal joints of the male not deeply incised.
- 16 (17) The thoracic stripes approximated in front and behind *scripta*, Mg.
- 17 (16) The thoracic stripes not approximated behind *nubeculosa*, Mg.
- 18 (13) The stripes on the thorax darker than the ground colour, and without darker margins, the two middle ones narrowed behind and approximated.
- 19 (24) Wing tip distinctly darkened, so that there is a conspicuous light band between it and the stigma.
- 20 (21) The pale sub-apical band includes nearly all the fourth posterior cell ; ♂ antennæ not longer than the thorax *hortensis*, Mg.

- 21 (20) The pale sub-apical band only includes just the base of the fourth posterior cell.
- 22 (23) Pleuræ with a blackish-brown longitudinal streak *rufina*, Mg.
- 23 (22) Pleuræ without a blackish-brown longitudinal streak; ♂ antennæ longer than head and thorax together *longicornis*, Schum.
- 24 (19) Wing tip scarcely darkened, at any rate no conspicuous pale band preceding it.
- 25 (28) Upper fork of the radial vein abbreviated, and not joined to the costa.
- 26 (27) First antennal joint blackish, second yellow *varipennis*, Mg.
- 27 (26) The two basal joints of antennæ yellow *hortulana*, Mg.
- 28 (25) Upper fork of the radial vein complete, and ending in the costa.
- 29 (30) The two arms of the second posterior cell looping parallel; wings very faintly marmorated *obsoleta*, Mg.
- 30 (29) The two arms of the second posterior cell a little approximated at their ends.
- 31 (32) Pleuræ whitish-grey, contrasting with the first abdominal segment; last abdominal segment of ♂ with scarcely any process...
confusa, v. d. Wulp.
- 32 (31) Pleuræ reddish, like the first abdominal segment; last abdominal segment of ♂ with conspicuous processes.
- 33 (34) Abdomen without blackish-brown lateral stripes; ♂ processes fringed with longish, fine, pale hairs *marmorata*, Mg.
- 34 (33) Abdomen with blackish-brown lateral stripes; ♂ processes exceedingly long, and bearing short, black, bristly hairs *signata*, Stæg.
- 35 (6) Disc of the wing with pale streaks, rather than spotted or clouded (*vide* also *T. pagana*, Mg., and *plumbea*, F., smallish species, with almost unicolorous wings, and *T. vittata*, Mg., a large species).
- 36 (37) Abdomen orange, with a dark dorsal stripe and no side lines...
vernalis, Mg.
- 37 (36) Abdomen with side lines, but no dorsal line.
- 38 (39) Marginal cell blackish-brown *marginata*, Mg.
- 39 (38) Marginal cell yellowish-brown..... *lateralis*, Mg.
- 40 (1) Wings unicolorous, except the stigma, or only with a pale streak all along near the brown costa, or with a pale spot or diagonal band just before the stigma.
- 41 (44) Costa dark brownish, sharply contrasted against the rest of the wing.
- 42 (43) Female with large wings, longer than the abdomen, and both sexes with a conspicuous longitudinal pale streak all along under the brown costa...
oleracea, L.
- 43 (42) Female with small wings, shorter than the abdomen, and without any distinct pale streak under the brown costa; male with the pale streak faint *paludosa*, Mg.
- 44 (41) Costa not contrasted against the rest of the wing.
- 45 (46) Wings blackish, short, especially in ♀; (small species) *nigra*, L.
- 46 (45) Wings yellowish, pale brownish or greyish, sometimes pellucid.
- 47 (58) Before the stigma is a small, often indistinct, pale spot, which never extends beyond the radial vein.
- 48 (53) Abdomen with a dark dorsal line.
- 49 (50) Antennæ entirely black or blackish-brown *melanoceros*, Schum.
- 50 (49) Antennæ yellow at base.

- 51 (52) Thorax with three brown stripes, of which the middle one is divided by a darker line *luteipennis*, Mg.
- 52 (51) Thorax with four brown stripes *pagana*, Mg.
- 53 (48) Abdomen without any dorsal line (*vide T. pagana*, Mg., a small unicolorous species, with almost apterous ♀).
- 54 (55) Antennæ yellow at base, very long in ♂ ... *flavolineata*, Mg.
- 55 (54) Antennæ entirely blackish.
- 56 (57) Veins clouded with grey, wings of ♀ short *plumbea*, F.
- 57 (56) Veins not clouded, wings of ♀ normal *pruinosa*, W.
- 58 (47) Before the stigma is a pale band or lunule, which extends at least to the discal cell, and sometimes beyond.
- 59 (60) Abdomen ashy-grey *lunata*, L.
- 60 (59) Abdomen luteous.
- 61 (66) Thorax ashy-grey, or brownish-grey or black.
- 62 (63) The whitish blotch before the stigma scarcely reaching the base of the discal cell *selene*, Mg.
- 63 (62) The whitish fascia before the stigma extends beyond the discal cell, sometimes to the margin.
- 64 (65) "Disc of thorax black," "veins simple in front of the discal areolet"...
vaga, Wlk.
- 65 (64) Thorax brownish-grey, veins normal *fascipennis*, Mg.
- 66 (61) Thorax ochraceous.
- 67 (68) Stigma brown, ♂ genitalia with a tufted plate beneath .. *ochracea*, Mg.
- 68 (67) Stigma pale brown, ♂ genitalia without the plate beneath...
pelio stigma, Schum.

I possess all the species intended by my list, except about five, and I possess five or six others at present unrecognised; it seems strange that so many species of such conspicuous insects as *Tipulæ* should remain uncertain, but the genus is a difficult one to *begin* understanding, and only a few persons have ever collected them at all exhaustively in any part of the world.

T. nigra, L.: common in marshy places, especially fens and large swamps.

T. confusa, V. d. Wulp, and *marmorata*, Mg.: I am very uncertain about these species; the one which occurs abundantly at Barton, near here, and has even appeared in my garden, was quite unknown to the Austrian Dipterists last January. I require more of the allied species.

T. signata, Stæg.: just after my list was published in 1886, I caught a male of this species at St. Favin's Head, near here, and almost directly after I saw two which Mr. Theobald had taken near Buxton.

T. rufina, Mg.: this and an allied species were common at Inchnadamph, and I fancy *T. rufina* is not uncommon in the north.

T. longicornis, Schum.: a decidedly common species, though Walker says, "Rare. In Mr. Haliday's collection (I)." I do not at present recognise *T. truncorum*, Mg., and *hortensis*, Mg., but I think I have the former, and, if so, it is a very handsome species.

T. hortulana, Mg.: I believe this to be a good species, allied to, but much rarer than, the next, though also widely distributed; its wing pattern is not quite the same.

T. varipennis, Mg.: common from Sussex to Tongue.

T. nubeculosa, Mg.: if I possess this species at all, it is a single male from Dolgelly; and on the same day (June 13th, 1887) I took two males of another unrecorded British species, which seems to be allied to *T. pruinosa*.

T. excisa, Schum.: I still think Walker had the common *T. scripta* before him when he described his *T. excisa*; nevertheless, true *T. excisa* is British, as I caught a beautiful male at the Llanberis foot of Snowdon on June 8th, 1887.

T. scripta, Mg.: one of our commonest species from the Isle of Wight to Sutherlandshire, or Newmarket to Dolgelly.

T. melanoceras, Schum.: I possess one male from Inveran (July 17th, 1886), which *may* be this species.

T. plumbea, F.: the species which Walker evidently intended by this name occurred in thousands near the half-way hut up Snowdon from Llanberis on June 8th, 1887. Whether it is the species Fabricius intended is open to very great doubt.

T. pruinosa, W.: not at all uncommon; a peculiarly leaden hued insect.

T. luteipennis, Mg.: I once found the males tolerably common in a small spot in Wicken Fen, but I could not detect any of the long-bodied female, nor could I catch any males twenty yards away from the spot; another time the same thing happened to me at Barton, near here, and so up to the present I do not possess the female.

T. flavolineata, Mg.: neither common nor rare, as far as I can judge; sometimes large females of this species are very conspicuous insects, so much so, that when I caught one at the entrance to a mine at Bettws-y-Coed, I thought I had some magnificent new British insect; I have never caught it further north than Bettws-y-Coed.

T. lunata, L.: a rather common species from Lyndhurst to Aberdeen.

T. marginata, Mg.: I do not clearly recognise this species; all I have seen are probably only varieties of *T. lateralis*, Mg.; Walker's *T. marginata* is certainly something quite distinct, possibly *T. vittata*, Mg.

T. vernalis, Mg.: a decidedly common species about the beginning of June; my specimens range from May 15th to June 22nd; I notice that I have no localities north of Newmarket. The collector will soon learn to know the peculiar wing-markings of this species.

T. vittata, Mg.: the Rev. E. N. Bloomfield has given me a pair of this handsome species, which he has found near Hastings. It is interesting to notice the similar plan upon which are arranged the apparently widely distinct wing-markings of *T. vittata*, *gigantea*, and *lutescens*.

T. oleracea, L., and *paludosa*, Mg.: whether ours are the true representatives of these two much vexed species, I cannot say; I believe our *T. oleracea* is quite identical with the Austrian species, but they do not seem to recognise our *T. paludosa* on the continent. Possibly, our two are only seasonal forms, as, although they widely overlap, I find *T. oleracea* an earlier insect than *T. paludosa*, say May to August, as against July (rarely June) to September; both are very common, and represent the destructive "Crane Fly," the best remedy against which I believe to be "rooks."

T. selene, Mg.: most probably British, but at present unknown to me.

T. fascipennis, Mg.: after obtaining a single specimen from Mr. J. H. A. Jenner, who caught it near Lewes, I found it abundantly at Dickleburgh in Suffolk, at the end of June; I know of other localities in Kent and Hampshire.

T. peliostigma, Schum.: in this group, in which I record four British species, we have probably at least ten, as far as one can judge from what Loew's investigations of the genital organs of the male have produced on the continent; I certainly know of another well marked species which I cannot name, and which is not uncommon; it is well distinguished by its blackish legs, besides the genital characters. The species which I believe to be true *T. peliostigma* is not uncommon in my garden in July, and, I believe, occurs not uncommonly elsewhere.

T. ochracea, Mg.: this is undoubtedly the commonest of the "ochraceous" group, but under it also undoubtedly are lumped many species; there is room here for any amount of study.

T. vaga, Wlk. : this is probably no *Tipula* at all, and could I see the original, I could most likely name it at once ; my belief is that it is a *Cylindrotoma*.

Dictenidia bimaculata, L. : I can give as localities, Worcester (Fletcher) and Guestling (Bloomfield).

Xiphura atrata, L. : I have a beautiful series of this species, proving the synonymy of *ruficornis*, Stæg., from Dr. T. A. Chapman (*vide* Ent. Mo. Mag., vi, p. 31).

X. nigricornis, Mg. : from some *Diptera* given me by Mr. G. C. Bignell, of Plymouth, is a specimen which I feel sure must represent this species.

(To be continued.)

ON TWO ADDITIONAL BRITISH SPECIES OF *SARCOPHAGIDÆ*, OR FLESH FLIES.

BY R. H. MEADE.

In 1876, I published a short Monograph in the 12th vol. of this Magazine upon the British species of the genus *Sarcophaga*, in which I briefly described twenty species ; since then only two fresh species belonging to the same family have come under my notice, one of which belongs to the restricted genus *Sarcophaga*, and seems to be new to science ; while the other has been placed in the genus *Theria* by R. Desvoidy, and though known upon the continent of Europe, has not before been recorded, I believe, as an inhabitant of England. The genus *Theria* contains only a single species, which, though included in the family of the *Sarcophagidæ*, because the arista is plumose at its base, bears a much closer general resemblance to the flies in the family of the *Tachiniidæ* ; the body being shorter and wider, and, together with the legs, furnished with stronger and more numerous spines than in the true *Sarcophagæ*.

R. Desvoidy gave the fly upon which he founded this genus, in 1830, the specific name of *palparis*, but it had been previously described, in 1826, by Meigen, as *Sarcophaga muscaria* ; it must, therefore, retain the latter specific name, as it has the claim of priority.

Theria muscaria.

Measures 12 mm. (about 6 lines) in length ; it is of a black-grey colour, tessellated, and marked with white in a somewhat similar manner to *Sarcophaga carnaria* ; it has large yellow palpi, somewhat thickened at the ends ; the thorax is cinereous, marked by three wide longitudinal black stripes ; the apex of the male abdomen is clubbed, but the segments are much smaller than in *S. carnaria* ; the tibiæ are armed externally with a regular row of bristles of even lengths, but the hind ones are without beads on their inner sides in the male, as in *S. carnaria*.

The discovery of this fine Muscid in England was made by Mr. Coryndon Matthews, of Erme Wood, Ivybridge, S. Devon, who captured a single female in that locality in the summer of 1887, which he kindly sent to me. The species seems to be rare throughout Europe.

Genus SARCOPHAGA.

S. FULVICAUDA, *sp. n.*

♂, whitish-grey, striped and tessellated as in *S. carnaria*; frontal space narrow; thorax with three dorso-central bristles behind the transverse suture; abdomen without central spines upon the edge of second segment; first anal segment shining black, second black upon the outer surface, but brownish-yellow beneath; hind femora villose, but not spinose, beneath; hind tibiæ with long beards on their inner surfaces; middle tibiæ also bearded; wings without spines on the axillary veins.*
Long., 6—7 mm.

Head—face prominent; frontal space about one-sixth of the width of the head; frontal stripe brownish-black, occupying nearly the whole of the space at its upper part; face silvery-white, with dark reflections; genal bristles small.

Thorax, with scutellum, cinereous; the former marked with three longitudinal black stripes on the dorsum, and with a short uneven one on the side in front of the base of each wing; scutellum with a slight black central streak.

Abdomen narrow, marked in the usual way; anal segments small, but projecting; the first shining black, the second with outer surface also black, but with the colour gradually changing until it becomes of a clear brownish-yellow on the under-surface, where it is prolonged in the shape of a cylindrical cone beneath the abdomen.

Wings with brownish-yellow tinge; costal spine large; external transverse vein nearly straight, and rather shorter than the distance from its point of junction with the fifth longitudinal vein, from the margin of the wing.

Legs with the hind femora furnished beneath with soft hairs, but few spines; hind tibiæ armed with strong bristles on their outer sides and ends, and having a long loose beard on their inner and anterior surfaces; middle tibiæ also bearded along the whole length of their under-sides with soft hairs, about half as long as those upon the hind tibiæ.

I have only seen two males of this well marked species, which I found some years ago near Bicester, in Oxfordshire. I do not know the females; it may possibly be the same as Meigen's *L. vagans*, the female of which is said to have the apex of the abdomen red; I hardly think, however, that he could have overlooked the fulvous, infra-caudal segment of the male. This species seems to occupy a position intermediate between the two divisions of the genus, viz., those with black, and those with red terminal abdominal segments.

Bradford: May 25th, 1888.

* In my Monograph upon the British *Sarcophagæ*, I named this vein the second longitudinal, after Zetterstedt; but properly it is part of the first longitudinal.

bases rather closer together ; a small black point projects in the site of the penis, and the terminal joint of the forceps limb is rather stouter. Can this be an extreme autumnal form of *B. rhodani* ?

October. Near Reading.

20. *Baëtis tenax*, Eaton : Mon., 116, pl. v, 22, 22a [adult details] ; Revis., 164, pl. lxiv, 16 [forceps] (1885 and 1887).

Differs from *B. vernus* in its better developed callus and denticulation, its more elongate and less obtuse terminal joint of the forceps limb, and in the basal joints of the limbs being more nearly approximated to each other.

Summer. Streams.

21. *Baëtis buceratus*, Eaton : Mon., 116, pl. v, 23, 23a [adult details] ; Revis., 166, pl. lxiv, 19 [forceps] (1885 and 1887).

Differs from *B. tenax* and *vernus* in the greater plumpness of the basal and second joints of the forceps limb, the latter being suddenly rounded off instead of gradually tapering distally ; in the relative bigness of the ovoid terminal joint ; and in the strong decurvature of the last two joints of the limbs, which was so suggestive of a similarity in curvature to bullock's horns held upside down as to determine the name of the species.

Spring. Near Reading.

22. *Baëtis pumilus*, Burmeister : Mon., 118, pl. v, 25, 25a [adult details] ; Revis., 166, pl. xvi, 29e, and lxiv, 20 [adult details] (1885 and 1887).

Differs from *B. niger* in having forceps somewhat similar in pattern to those of *rhodani*, with the terminal joint sub-globular.

May to October. Streams.

23. *Baëtis niger*, Linné : Mon., 119, pl. v, 26, 26a [adult details] ; Revis., 167, pl. xvi, 29f [forceps] (1884 and 1885).

Differs from *B. pumilus* in the singular form of the forceps. The terminal joint of each limb is extraordinarily elongate and narrow, being nearly of the same width and about three-quarters as long as the preceding joint, these joints resembling the homologous parts of *Habrophlebia fusca*.

Early summer and autumn. Rivers.

24. *Centroptilum lutcolum*, Müller : Mon., 108, pl. ii, 8, and v, 13, 13a [adult details] ; Revis., 175, pl. xvii, 30a, and lxiv, 21 [adult details], and pl. xlvi [nymph] (1884, 5, and 7).

Hind-wing acute. Turbinate ♂ eyes light red. Above the forceps bases is a small acute median projection. Apt to be confused with *Baëtis binoculatus* and *Cloëon rufulum*.

April to November. Streams.

25. *Centropilum pennulatum*, Eaton: Mon., 109, pl. v, 14, 14a [adult details]; Revis., 176, pl. xvii, 30b [adult details] (1884 & 1885).

Hind-wing obtuse. Turbinate ♂ eyes light orange-yellow.

Summer and autumn. Streams.

26. *Cloëon dipterum*, Linné: Mon., 102, pl. v, 10 [forceps]; Revis., 182, pl. xvii, 31a [adult details], and xlii, 22 [setæ of nymph] (1884 and 1885).

Wing of ♀ mottled with amber along the costa; ♂ wing colourless, with fewer (two or three instead of about ten) straight pterostigmatic cross veinlets. Penis (?) dark, acute. Turbinate eyes (in Great Britain) dull light reddish or reddish-brown.

Summer. Ponds.

27. *Cloëon simile*, Eaton: Mon., 103, pl. v, 11 [forceps]; Revis., 186, pl. xvii, 31b [adult details], and xlvii, 2—21 [details of nymph] (1884 and 1885).

Wing in both sexes unadorned, and with numerous irregularly sinuate pterostigmatic cross veinlets. Forceps limbs nearly contiguous at the base. Turbinate ♂ eyes olivaceous or dark greenish-sulphureous.

Summer and autumn. Lakes.

28. *Cloëon rufulum*, Müller: Revis., 188, pl. xvii, 31c [adult details], and xlvii, 1 and 4 [nymph and antenna] (1884 and 1885), = *Cl. russulum* (misreading for *rufulum*), Cat., p. 9; Mon., 105, pl. v, 12 [forceps].

Wing in both sexes unadorned (unless, perchance, through slight infiltration of chlorophyll), and with several (6—8) oblique, somewhat simple cross veinlets in the pterostigmatic space. Forceps limbs distant at the base. Turbinate ♂ eyes sometimes sulphureous, sometimes reddish-brown.

Summer. Ponds and ditches.

29. *Siphylurus armatus*, Eaton: Mon., 126, pl. vi, 1, 1a [adult details]; Revis., 216, pl. xx, 34e [adult details] (1884 and 1885), = *Siphonurus armatus*, Cat., p. 10.

Pleura of ♂ abdominal segment nine broadly dilated oniscoidally, forming large, acute, tooth-like projections behind. ♀ unknown.

Killarney and Middlesex. July.

30. *Siphylurus lacustris*, Eaton: Mon., 126, pl. vi, 2 [forceps]; Revis., 217, pl. xx, 34d [adult details], pl. 1 (part) [nymph] (1884 and 1885), = *Siphonurus lacustris*, Cat., p. 10.

Pleura of very moderate proportions, forming only an inconspicuous tooth on each side of the ninth ♂ abdominal segment.

Hill streams and mountain lakelets. Wales to Scotland. Summer

31. *Rhithrogena semicolorata*, Curtis: Revis., 236 and 256, pl. xxiv, 43, 43e [adult details], and pl. liv (part) [nymph] (1884 and 1885), = *Heptagenia semicolorata*, Cat., p. 10; Mon., 136 (including *semitincta*, Pict.), pl. vi, 9 [genitalia].

In addition to the discoloration of the basal portion of the wings, usually noticeable, the ♂ of this species can be identified by the narrow, flattened genital stimuli, abrupt and minutely denticulate at the tip, and closely appressed to each lobe of the penis.

Streams and rivers. Summer and autumn.

32. *Heptagenia sulphurea*, Müller: Revis., 236 and 268, pl. xxiv, 45 [legs and penis] (1884 and 1885), = *H. elegans*, Cat., p. 10; Mon., 145, pl. iii, 5, and vi, 18, 18b [adult details].

Metathorax spotless at the sides. Femora not banded. Very similar to *H. flavipennis* in other respects. Defective specimens of *Potamanthus luteus*, especially if in sub-imago, are liable to be classed with *Heptagenia* in collections. Neither of our British species has the dark longitudinal dorsal stripe on the abdomen noticeable in allied continental species. The nymph of *Heptagenia* is figured in Revis., pl. lx.

Summer and autumn. Rivers and streams.

33. *Heptagenia flavipennis*, Dufour: Mon., 144, pl. vi, 17, 17c [adult details]; Revis., 273 (1885), = *Baëtis longicauda*, Stephens, Cat., p. 11 [excl. *B. subfusca*, Steph.].

Fore femur more or less faintly dark-banded in the middle. Metathorax with a small rounded black spot on each side behind the upper part of the leg socket.

Summer. Rivers. Near Reading.

34. *Ecdyurus venosus*, Fabricius: Revis., 236 and 283, pls. xxiii and xxiv, 46 [adult details], and lxii [nymph] (1884, 5, and 7), = *Heptagenia venosa*, Cat., p. 11; Mon., 151, pl. vi, 24 [genitalia], = *H. longicauda* (not of Steph.), Cat., p. 11; Mon., 152, pl. vi, 25 [genitalia], = *Baëtis subfusca*, Stephens, Cat., p. 11 [in synon.], = *B. montana*, Hag., Ent. Ann. (1863), p. 26.

Fore femur uniformly pitch-brown, excepting just at the base. The impressed ventral dots and dashes are usually colourless. Pterostigmatic region of the fore-wing usually obscured, sometimes clear. A browner species than the next.

Streams and rivers. Summer and autumn.

35. *Ecdyurus insignis*, Eaton: Revis., 288, pl. xxiv, 46d [penis from above], = *Heptagenia insignis*, Cat., p. 11; Mon., 153 (excl. *Baëtis montana*, Hag.), pl. vi, 26, 26b [genitalia and ventral markings].

Fore femur uniformly pitch-brown. The impressed ventral dots and dashes in segments one to seven of the abdomen are black. In the pterostigmatic region of

the fore-wing, between the costa and the radius, at nearly two-fifths of the distance from the bullæ towards the apex of the costal area, is a small blackish cloud. In its general colouring, this is more of a greenish-olive than the other species.

Rivers in England. Summer.

36. *Ecdyurus volitans*, Eaton: Revis., 291 (1887), = *Heptagenia volitans*, Cat., p. 10; Mon., 147, pl. vi, 20 [genitalia], = *H. flavipennis*, var. ? *volitans*, Etn., Revis., 274 (1885).

Femora dark-banded in the middle and at the tip, more distinctly in ♀ than in ♂, especially in the hinder legs, where the ♂ lacks the median bands. Sides of the thorax more decidedly or obviously lighter in colour than the dorsum than is the case in the preceding species. Venter usually spotless. The reticulation of the pterostigmatic space is unusually open.

Thames, near Reading. Summer.

37. *Ecdyurus lateralis*, Curtis: Revis., 294 (1887), = *Heptagenia lateralis*, Cat., p. 11; Mon., 155, pl. vi, 27 [genitalia].

A small species, about half the size of the other British species of the genus. The sub-imago might be placed in cabinets among *Cloëon simile* or *Ephemerella ignita*. The living adult has some resemblance to big specimens of *Baëtis vernalis* or *rhodani*. The ♀ imago is liable to be confounded with small and ill-marked examples of *Rhithrogena semicolorata*; but the pterostigmatic cross veinlets of the fore-wing anastomose to some extent in the *Ecdyurus*, and the ventral lobe of her ninth abdominal segment is sub-acute or entire.

Lakes and trout streams. Summer.

Shopton Montague Vicarage,

Castle Cary, Somerset:

20th March, 1888.

Carriion beetles attracted by Arum dracuncul.—The “snake arum” (*A. dracunculus*, W.) is an exceedingly handsome plant, with its spotted stem, deeply divided leaves, and great velvety spadices a foot or more in length, of the richest maroon-purple inside: but its odour by no means recommends it for the garden, being precisely that of very putrid flesh. Certain *Coleoptera* would appear, as has long been known, to be as partial to this odour as to that of their proper pabulum. In a garden at Rosia, where I lately had an opportunity of examining the plant for the first time, I found, in a single spadix, besides flies of the genera *Calliphora* (*vomitaria*, L.) and *Scatophaga*, quite a crowd of beetles, all carrion-feeders, viz.: *Creophilus maxillosus* (2), *Dermestes vulpinus* (1), *Saprinus*, 10 specimens of three species, the handsome *S. semipunctatus*, F., among them, and a species of *Oxytelus* in great numbers. Other spadices contained the same beetles in equal plenty, so the flowers ought to be most efficiently fertilized. — JAMES J. WALKER, H.M.S. “Grappler,” Gibraltar: May 22nd, 1888.

A NEW SPECIES OF *CYCLOPIDES* FROM CHILI.

BY WM. BARTLETT-CALVERT, F.E.S.

CYCLOPIDES PUELME, *sp. nov.*

Alis anticis supra fuscis; macula apicali, maculaque transversa, oblonga, flavis; hac in femina majore; posticis supra, in mare aureis, in femina cupreis, margine abdominali fusco; subtus in mare omnibus aureis immaculatis; in femina alis anticis aureis pallidioribus, macula sub-apicali quadrata, fusca; posticis, aureis pallidioribus immaculatis. *Ex. al., 32 mm.*

♂. Near to *C. aureipennis*, Blanchard; anterior-wings on the upper-side differing from *aureipennis* in the larger size of apical spot, and the two discal spots of *aureipennis* are in *puelmæ* united, forming a broad irregular band across the wing at the end of cell; the apical spot and band are brighter than in *aureipennis*, and the band does not quite reach the costal border; posterior-wings of a burnished gold, with the abdominal margin dark brown; under-side of all the wings golden, as in *aureipennis*. *Expands 32 mm.*

♀. Aspect of male, but spots and band on fore-wings larger, and duller in colour; hind-wings chrome-yellow, with bronzy reflections, abdominal border brownish, and wider than in male; under-sides of all the wings of a brilliant gamboge-yellow, fore-wings with a large brownish quadrate spot situated at the extremity of the cell, the spot and band of upper surface slightly visible.

Expands from 32 to 34 mm.

Hab.: Cordillera of Peméhue, Araucanía, Chili, in February.

Colegio Ingles, Santiago de Chile:

April 10th, 1888.

ADDITION TO THE LIST OF BRITISH *HEMIPTERA*.

BY EDWARD SAUNDERS, F.L.S.

MONANTHIA ANGUSTATA, H.-S.,

Wanz. Ins., iv, p. 61, tab. 107, fig. 397b.

Pale brownish-grey; head black, clothed with silvery hairs, and with two pale spines in front above the antennæ; antennæ with very short adpressed hairs; pronotum with the sides narrowly reflexed, bearing one row of meshes posteriorly, but with indications of a second row in front; hood hexagonal, deeply meshed, and with a central carina; disc with three longitudinal carinæ, which are sub-parallel, and paler than the intervals between them; intervals meshed posteriorly, but anteriorly clothed with short, adpressed, scattered, silvery hairs; carinæ (looked at sideways) shewing meshes posteriorly; elytra with two rows of meshes at the sides, the interstices occasionally with darker markings, the sides gradually converging towards the apex, and slightly sinuate at about their posterior third; beneath brownish; legs brownish-yellow. *Length, 3 mm., breadth, 1½ mm.*

One specimen by sweeping, near Cisbury, Worthing.

This species belongs to the same section of the genus as *M. cardui*, and much resembles a narrow example of that species; but it is much

more elongate, has only one row of meshes along the sides of the thorax, whereas *cardui* has two, the reflexed margins being much narrower; the elytra also only bear two rows of lateral meshes, whereas in *cardui* they bear three, and the whole insect is slightly smaller and less variegated with dark blotches.

This appears to be a rare insect on the continent, but to be widely distributed, although I do not see any records of its capture from so far north as England; it occurs, however (according to Dr. Puton), at Versailles, Metz, and in the Vosges, as well as further south. I have two examples in my own collection, one from Greece and the other from Corsica; one of which was named by Dr. Puton, and agrees exactly with the specimen here described. Its food-plant seems to be unknown.

St. Ann's, Mount Hermon, Woking:
June 8th, 1888.

Macropterosus form of Ischnocoris hemipterus, &c.—This little bug is rarely seen with the elytra and wings developed, in fact, I am not sure that there is any record of its occurrence in this country in that condition, I was, therefore, much surprised to take several, on the 19th May, with the membrane fully expanded, and belonging to both sexes, under heaps of coarse grass, &c., which had evidently been cut down in the autumn and had lain rotting on the ground all the winter in a field just opposite my house. It seems to me to be a curious locality for the species to frequent, as it has generally occurred to me at the roots of the heather, &c., and Messrs. Douglas and Scott also give its locality as "in moss among heath," and, although every one knows the heathy nature of Woking, yet there is no actual heath land within a quarter of a mile of the spot in question. The insect was rare, but all the specimens I found were macropterous, and I could see no signs of the ordinary micropterous form. After I had searched this locality, which yielded me, besides the *Ischnocoris*, a profusion of specimens of other common *Rhyparochromidæ*, such as *Peritrechus puncticeps* and *luniger*, *Scolopostethus affinis* and *ericetorum* (the latter also usually a heath species), *Rhyparochromus chiragra*, *Trapezonotus agrestis*, *Stygnus arenarius*, *Drymus sylvaticus*, &c., I went on to a heathy spot where I at once found a specimen of *Ischnocoris hemipterus*, micropterous as I should have expected. It therefore seems to me probable that this colony of macropterous examples may have been the result of eggs laid in a locality more favourable for development than the heath which the insect generally frequents. The other European species of this genus, *I. punctulatus*, which occurs in the south, and which I much hoped I had caught when I captured my first macropterous *hemipterus*, always comes developed so far as is known. I have never taken it myself, but, from the remark in Ferrari's "*Hemiptera Agri Ligustici*," Ann. Mus. Civ. Gen., VI, p. 159, viz.: "in aridis sub cespitibus *Artemisia campestris*," it would appear to occur in somewhat similar localities to those in which we find our *hemipterus*, at any rate they occur together there, as he remarks after *hemipterus*, "*cum præcedente*."—EDWARD SAUNDERS, St. Ann's, Mount Hermon, Woking: June 8th, 1888.

Stylops melittæ on the wing near Woking.—On May 21st I captured a specimen of this insect on the wing about 10.30 a.m. It is so seldom seen at large that I thought a record of its capture would be interesting—it was well up in the air, quite six feet from the ground, and its flight reminded me of that of the Neuropterous genus *Hemerobius*.—ID.

Dicyphus constrictus, Boh.—At p. 49 of vol. xx of this Magazine, Dr. O. M. Reuter gives a synopsis of the species of *Dicyphus*, among which appears *D. constrictus*, Boh., recorded from Perth as having been taken by him on *Symphytum*. It is not impossible that this species may be found intermixed with *pallidus*, D. & S., in collections, and be less rare than would be supposed from the fact that Dr. Reuter's capture remained the only record for the United Kingdom until Mr. Edward Saunders detected two individuals (previously named for me "*pallidus*" and "*pallicornis*") among my type specimens. One is undeveloped. Both were taken by me in a small copse in the parish of Well, within half a mile of my house, either from ash or white willow, or the herbage under one or other of those trees, on the 29th September, 1886.—JAS. EARDLEY MASON, Alford, Lincoln: May 14th, 1888.

Coccinella labilis, Muls., attached to the nests of *Formica rufa*.—While collecting *Coleoptera* in Abbot's Wood, on the 2nd June last, I came across this rare beetle rather commonly in a clearing of one year's growth; it was a warm sunny day, and they were to be taken in various ways, some by sweeping, others crawling on the ground, or up the trunks of the trees, while many were flying round the nests of *F. rufa*, accompanied by *Clythra quadripunctata*. It would be interesting to know if this insect has been taken in a similar way before; they appeared to be very local, although not uncommon in this particular clearing, in the vicinity of the nests, as we found about fifty specimens in the course of an hour or so; other beetles were very scarce, in fact, what few we did sweep were seized by the ants before we had time to examine them.—C. H. MORRIS, School Hill, Lewes: June, 1888.

The nomenclature of Dr. Rudow's new species of Amblyteles.—Dr. Rudow, in the "Entomologische Nachrichten" for 1888 (vol. xiv), has described some new species of *Amblyteles*; on page 85 he describes a male and female as *A. fumipennis*, Rd.; and on page 86, he describes another pair also as *A. fumipennis*, Rd.; on page 89 he describes a female as *A. quadrimaculatus*, Rd., this name was given by Gravenhorst to a female which Holmgren unites with *A. fasciatorius*, Fab., male; on page 91 he has used the name *A. erythropygus*, Rd., this is another of Gravenhorst's names, and is given by Wesmael and Holmgren as a variety of *A. palliatorius*, Gr.; on page 133 another is named *A. bicolor*, Rd., this name was used by Dr. Kriechbaumer, in 1862 (Entomologische Nachrichten, p. 240). The nomenclature of Ichneumons is already so confusing that I think one ought to use as much care as possible to avoid making it worse; it is scarcely pardonable to use the same name on consecutive pages, and, although the two Gravenhorstian names have been sunk into synonyms, I do not think they ought to have been used for fresh species. Dr. Rudow will certainly have to re-name *A. bicolor*, Rd.—JOHN B. BRIDGMAN, Norwich: June, 1888.

Oxyporus rufus, L., in Scotland.—I took a male specimen of *Oxyporus rufus*, L., yesterday in a fungus close to this house. It has not, I think, hitherto occurred in Scotland.—W. D. R. DOUGLAS, Orchardton, Castle Douglas, N.B.: June 12th, 1888.

Perileptus (Blemus) areolatus, &c., at Llangollen.—While searching for *Bembidia* on the banks of the Dee, a few miles above Llangollen, at Whitsuntide, Dr. Ellis and I were delighted to meet with the rare *Perileptus areolatus*. The sun was very hot, and the insect was running and flying with surprising agility among the shingle, and bottling it was a matter of some difficulty. This is, I think, the first record of its presence on the Dee.

During our three days' stay we got many other interesting species, including the following:—*Miscodera arctica* (sparingly), *Calathus micropterus* and *Harpalus ignavus*, under stones on the high moors; *Bembidium decorum*, *punctulatum*, *tibiale*, and *atrocaruleum*, among shingle; *Quedius auricomus*, *Dianous cærulescens*, and *Elmis æneus*, in *Sphagnum* in mountain streams; *Aphodius erraticus*, *hæmorrhoidalis*, *sticticus*, *Onthophagus ovatus* (common), and *Geotrupes vernalis*, in sheep dung; *Clytus mysticus* (one), *Pogonocherus hispidus* (several), and *Priobium*, by beating dead sticks in hedges; *Corymbites æneus* and *holosericeus*, under stones on the moors.—R. WILDING, 40, Downing Street, Liverpool: June 13th, 1888.

Baris cuprirostris, Fabr., &c., at Calais.—On May 21st, having a few hours to spare at Calais, I devoted a short time to searching for insects on the sand-dunes to the west of the town. As might have been expected, from the similarity of the place, the usual run of Deal things were to be found; but amongst these occurred several species very rare with us in England, as *Necrophorus germanicus*, *Agelastica alni*, *Cassida ferruginea*, &c., and in Hemiptera, *Emblethis verbasci*. The only insect noticed as not British being *Baris cuprirostris*. This latter it is just possible may eventually be found along our southern coast, if its food-plants were carefully searched. *B. cuprirostris* is very widely distributed in Europe, but becomes rarer northwards, and is equally common in Algeria. Its narrow shape, bright metallic greenish-æneous or golden-green colour, and coppery rostrum, distinguish it at once. According to Allard (Ann. Soc. Ent. Fr., 1870, p. 303), it is found upon *Diplotaxis tenuifolia*; and Mr. J. J. Walker writes me that he has recently found it in numbers at Gibraltar upon the common charlock, *Sinapis arvensis*. Its food-plant at Calais I did not observe.—GEO. C. CHAMPION, 11, Caldervale Road, Clapham, S.W.: June 13th, 1888.

Description of the larva and pupa of Cynthia Erotia, F.—*Larva*, when full-fed, one and a half inch in length. Pale olive-green, considerably darker between the segments. Six short spines on each segment, the two upper much the longest; all with yellow bases. Two upright horns, half-an-inch in length, curving backwards on head, which is dark brown. Legs dark brown. Spiracles marked as a black dot, pale whitish on either side.

Pupa. Suspended by tail; varying shades of umber-brown. A prominent ridge over thorax. Two alæ anteriorly narrowly pointed on either side of outer margin of wing-cover. Two smaller alæ on either side of 12th segment. Between alæ and on

either side of dorsum two pairs of diamond-shaped spots, pale green, one pair behind posterior alæ. Two silver spots on either side of thoracic ridge anteriorly, and three splashes of silver posteriorly. A dark line extends from the outer margin of the wing-cover to tail. Fifteen days in pupa.—N. MANDERS, Medical Staff, Lashoe, Shan States, Burmah: *March*, 1888.

Distribution, time of appearance, habits, size, &c., of the genus Selenia.—I have to thank Mr. Gardner for his communication in the May number. From letters received from Mr. Barrett and Mr. Bower, the latter enclosing some excellent drawings from life, it appears clear that *lunaria* rests in the position of *illustraria*, not *illunaria*. As to size, careful measurement of three broods, comprising more than two hundred individuals of the latter species, confirms the belief arrived at by me last year from an inspection of several local collections, that, in the first emergence of the year, occurring in March and April, the ♂ exceeds the ♀ in average wing-expansion. This excess existed in each of the three broods, and averaged from 0.06 to 0.38 mm. The difference is slight, but it compares with a considerable difference the other way in the summer emergence, viz.: 1.78 to 3.22 mm., as tested by measurement of some hundreds of individuals belonging to several broods. In the first emergence of this year the largest individual was a ♂ of 51 mm., the largest ♀ being 49.30 mm.; in the summer emergences last year the largest individual was a ♀ of about 44.00 mm., the largest ♂ being about 42.30 mm. I have also reared this spring three broods of *illustraria*, comprising more than three hundred individuals; the wing-expansion of the ♀ in this species averaging from 1.76 to 2.30 mm. in excess over that of the ♂; the largest individual was a ♀ of 52.20 mm., the largest ♂ being 49.60 mm. It is, therefore, in the first emergence, and the first emergence only, of *illunaria* that we find the exception to the ordinary rule that the ♀ is larger than the ♂; a circumstance which, perhaps, has some connection with the fact that so large a proportion of those single-brooded moths which appear in winter months have apterous or quasi-apterous females. As to the measurements given, it may prevent misunderstanding to mention that the insects were so placed for measurement as to give the extreme expansion from tip to tip of which they were capable; about 4 or 5 mm. (2 "lines") would have to be deducted for comparison with moths set for cabinet purposes and in the English fashion; 2 inches being equal to 50.798 mm.—F. MERRIFIELD, 24, Vernon Terrace, Brighton: *June*, 1888.

Continental form of Anthocharis cardamines.—It may be worth noting, in view of observations by Mr. J. Jenner Weir, reported in the May No. of the Magazine, p. 279, that a specimen I bred last year has a very large central spot, with the orange colour $1\frac{1}{2}$ mm. nearer the base than this, and extending 2 mm. along the inner margin, or with only a slender line between, so that the inner margin of the orange is more perpendicularly across the wing than usual, and occupies three-fifths of the area instead of the usual two-fifths or one-third.—T. A. CHAPMAN, Hereford: *May*, 1888.

Note on certain Notodontæ.—I have recently bred a few *Notodontæ*, and observed that the females were very restless for a brief period on the evening after emergence before the males moved, the activity of the males being of much longer duration. I had the pleasure of observing females of *trepida*, *chaonia*, and

dodonæa, at large, use this period to fly upwards and settle among the branches and leaves (if out); the object being clearly greater safety. This accounts for the comparative rarity of such species on trunks of trees, except they be met with immediately on emergence, and that fertile females found on trunks are so frequently cripples, having been unable to take this preliminary flight.—ID.

Variation in Arctia mendica.—From a batch of eggs of *Arctia mendica* found on a dock leaf here last year, I have this season reared a beautiful and variable series of imagines. The moth here is often more spotted than the usual form of the species as generally known, and frequently has a band, more or less broken, of large black spots inside the margin of the hind-wings; but I was quite unprepared for the extent of variation exhibited in these bred specimens. 44 specimens (25 ♂ and 19 ♀) emerged, and of them not more than about 8, including both sexes, approach the ordinary type of the species. The ground colour of many of the ♀ shows a creamy tint, very few being of the "satin"-white, as usually seen; nearly all have a closely arranged band of large black spots round the inner margin of the hind-wings; many have also a narrow but clear black edging to the base of the fore-wings, though in others the margin is only spotted. The most extreme specimen has also in addition a curved central band of black, and three black streaks, besides spots on each of the fore-wings; and from this form the series shows a gradual range of variation to almost the ordinary form. The ♂s exactly correspond in markings with the ♀s; they are darker, I think, than any I ever saw before, but still the band of black spots on the hind-wings, and all the bars, streaks and spots of the fore-wings, even to the basal edging, can be distinctly seen.—GEO. T. PORRITT, Huddersfield: June 12th, 1888.

Larva of Douglasia ocnerosomella.—This larva has been described by Herr Herms, of Alt-Damm, near Stettin, in the Stettin. Ent. Zeit., 1888, p. 82. It feeds on the pith of the stem of *Echium vulgare*, and is full fed at the end of October. The moth had been bred in this country from dry *Echium* stems, as far back as 1856 (see Ent. Ann., 1857, p. 125), but the habit of the larva was unknown. The larva forms a firm cocoon, mixed with particles of the pith, inside the stem, but does not assume the pupa state till the following spring. Herr Herms states that it was owing to the suggestion of Major Herms, who had received from Herr Stange, of Friedland (Mecklenburg), *Echium* stems containing cocoons, that he had been led to find these larvæ in his own neighbourhood.—H. T. STANTON, Mountsfield, Lewisham: June 9th, 1888.

Larva of an Agdistis on Artemisia campestris (Agdistis adactyla).—A discovery has just been made which may prove of interest to some English Micro-Lepidopterists. Herr Stange, to whom we are already indebted for the discovery of *Oxyptilus leonuri* (on *Leonurus cardiaca*), and for the natural history of *Douglasia ocnerosomella* (in the stems of *Echium*), has sent me three *Agdistis* larvæ, which he found, living well concealed, amongst the stems of *Artemisia campestris*. In July, 1887, I noticed that *Agdistis adactyla* was flying in plenty amongst *Artemisia campestris* near Stettin. I have therefore written to Dr. Schleich to urge him to follow up this discovery there.

The larva (from 12 to 14 mm. long) is dark ashy-grey, with two pale lateral

stripes, has horny protuberances on all the segments, those on the third and fourth segments being the longest; each horn bears a brown-grey hair directed backwards. Seen from above the larva has a pale dorsal stripe edged with a darker line, which is composed of obliquely-placed dark streaks.

The larva is sluggish, but when hungry or if disturbed, can crawl more quickly than the larva of *Agdistis tamaricis*. When touched, the larva assumes a torpid, motionless state.—E. HERING, Zoologisch. Museum, Königl. Universität, Berlin C.: June 11th, 1888.

On Melanism in Lepidoptera.—A casual observation this spring led me to form a hypothesis as to the cause and meaning of melanism in *Lepidoptera*, which appear to explain a considerable majority of the instances, and, at the same time, correlates various facts in connection with it, that are otherwise of obscure import. I am not sufficiently acquainted with the literature of the subject to know whether the same hypothesis has been advanced before, but I do not happen to have met with it. Melanism appears to be a western rather than a northern form of variation; to be associated with a wet rather than with a cold climate; and it has certainly been more common of recent years, which may be attributed to the long succession (unprecedented) of wet seasons we have recently passed through. My observation was on *D. fagella*. Twenty years ago this species afforded here an occasional dark or even black *var.* Happening to meet with one of these, I searched carefully for two seasons, but only got one black and two dark specimens. For the last year or two (result of wet seasons) they have been fairly numerous. Visiting certain oak trees with a lantern one night, lately, and the same observation night, occasion favouring, no doubt have been made during the day, I found the dark *var.* quite numerous, about one to three of the ordinary form. The point I wish to call attention to is this, the afternoon had been showery, and one side of the trunks was very wet, the other dry, the wet side was of a very dark colour, the dry portions pale, and, as a consequence, the dark specimens of *fagella* were very conspicuous on the dry portions, hardly visible on the wet, whilst with the ordinary form the conditions were reversed, those on the wet bark were conspicuous, those on the dry much less so. This observation appears to admit of generalising, because we know that many trunks of trees, rocks, stones, mosses, &c., are much darker in colour when wet, the change often being from pale grey to black, and that most of the species that are subject to melanic variation are such as are in the habit of resting on such objects; natural selection would thus have abundant leverage to work with. I do not know whether the melanism of the Lancashire and Yorkshire districts is acknowledged to depend on the general griminess of all natural objects, trees, stones, &c., but there is no doubt that this blackness of the resting places of insects is intensified when they are wet. This hypothesis will not probably explain all cases of melanism, but it seems to be widely applicable.—T. A. CHAPMAN, Hereford: May, 1888.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY:
May 24th, 1888.—T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Messrs. A. H. Japp, L. Stevens, and J. C. Matthews were elected members.

Mr. Jäger exhibited a larva of *Nemeophila plantaginis*, L., which he had found dying, with a *Gordius* emerging from it. Mr. Helps showed *Dianthaccia capsicola*,

bred from larvæ obtained in Norfolk. Mr. R. Adkin, a fine series of *Aphalia ridens*, Fb., bred from pupæ received from the New Forest; the specimens showed a considerable amount of variation, some of the females being very white. Mr. T. R. Billups, specimens of *Bracon brevicornis*, Wsm., parasitic on *Ephestia Kühniella*; he remarked that Mr. Marshall once reared the females from the gulls of *Andricus terminalis*, Fab.; Mr. W. F. Kirby had bred six males and one female from *Ephestia elutella*, Hüb.; Herr Brischke obtained a male from *Diorctria abietella*; while Mr. S. Webb, of Dover, had bred a male from *Myelois ceratonia*, Zell. Mr. Fenn read a paper on "British Land and Freshwater Mollusca."

June 14th, 1888.—J. T. CARRINGTON, Esq., F.L.S., Vice-President, in the Chair.

Mr. Robinson exhibited ringed forms of the larva of *Trichiura eratagi*, L., from Monkswood, and asked whether it was a common variety of the larva. Mr. Tugwell said he had never met with this particular form, although in his experience the larva of this species varied considerably. Mr. Lowrey, a male *Tæniocampa stabilis*, View., taken in copulâ with a female *T. gothica*, L.; ova were obtained, of which only a few hatched, the larvæ eventually died. Mr. West, Streatham, a moth reared from a larva found in Switzerland, and which was thought to be *Acronycta leporina*, L.; also a larva found on breaking up some tea chests from China, with pieces of the wood showing the ravages—possibly a species of *Buprestidæ*. Mr. R. Adkin, specimens of *Cnephasia musculana*, Hb., *Eriopsela fractifasciana*, Haw., *Phoxopteryx comptana*, Fröl., *Eupæcilia ciliella*, Hb., taken at the Society's Excursion to Horsley on May 26th, and remarked, that in his experience, the present season was even later than in 1887.

The Secretary read a communication from Mr. T. D. A. Cockerell on dichroism in the bands and marking of *Sesia*, *Zygæna*, *Arctia*, &c., referring to a note by Mr. Frohawk in the "Field" (1887, p. 828) as to his having taken a "white-banded" example of *Sesia culiciformis* at West Wickham. Mr. Tutt read an article by Mr. Cockerell from the "Canadian Entomologist" for May, "On the nature of seasonal dimorphism in *Rhopalocera*."

Mr. J. T. Williams mentioned that in the neighbourhood of Foot's Cray, Kent, the larvæ of *Bombyx neustria*, L., were unusually abundant; also that he had noticed a number of hibernated specimens of *Vanessa cardui*, L. Mr. Carrington and Mr. Tutt also recorded the appearance of specimens of *V. cardui*, and referred to the large number of hibernated specimens of *Plusia gamma* noticed in different districts.—H. W. BARKER, Hon. Sec.

ENTOMOLOGICAL SOCIETY OF LONDON: June 6th, 1888.—Dr. D. SHARP, F.L.S., President, in the Chair.

Mr. George Meyer Darcis, of 32, Central Hill, Upper Norwood, was elected a Fellow of the Society.

Mr. Pascoe brought for exhibition a book of fine plates of *Mantidæ* drawn by Prof. Westwood, which it had been hoped would have been published by the Ray Society.

Mr. E. Saunders exhibited a species of *Hemiptera*, *Monanthia angustata*, H.-S., new to Britain, which he had captured by sweeping, near Cisbury, Worthing. The insect is rather closely allied to the common *Monanthia cardui*, L.

Mr. McLachlan exhibited a species of *Halticidæ*, which had been sent him by Mr. D. Morris, Assistant Director of the Royal Gardens, Kew, who had received them from Mr. J. H. Hart, of the Botanic Gardens, Trinidad, with a note to the effect that they had attacked young tobacco and egg plants badly in that island. Mr. Jacoby had, with some reserve, given as his opinion that it might possibly turn out to be *Epitrix fuscata*, Duv., a species which had been described from Cuba.

The Rev. H. S. Gorham exhibited a collection of beetles lately captured in Brittany, including *Diachromus germanus*, L., *Onthophagus taurus*, L., *Hister sinuatus*, Ill., and other species which are exceedingly rare, or altogether wanting in Britain, and yet occur very commonly in the North of France.

Mr. Enock exhibited specimens of the Hessian Fly bred by himself, and mounted for the microscope.

Mr. White exhibited living larvæ of *Endromis versicolora*, and remarked that when quite young they are nearly black, owing to being very thickly spotted with that colour; the body-colour is green, and after the second change of skin the spots disappear. Mr. White also exhibited two preserved larvæ of *Phorodesma smaragdaria*, which he had recently taken, and made some remarks concerning the so-called "case" which this insect is said to construct from the leaves of its food-plant, *Artemisia maritima*. This he did not consider to be really a case, but he had discovered that the larva possessed on its segments certain secretory glands, at the apex of each of which there is a bristly hair; this appears to retain pieces of the plant, which are probably fixed firmly afterwards by means of the secreted fluid. These pieces are very irregularly distributed, and their purpose is evidently protective.

Mr. Lewis exhibited about three hundred specimens of the genera *Hetærius*, Er., and *Eretmotus*, Mars. The most remarkable of these was *Hetærius acutangulus*, Lewis, discovered last year by Mr. J. J. Walker, near Tangier, and were recently taken by him at S. Roche, in Spain. The names of the other species exhibited are:—*Hetærius Bedeli*, Lewis, *H. punctulatus*, Lucas, *H. cosmosellus*, Fairmaire, *H. pluristriatus*, Fairmaire, *H. setulosus*, Reitter, *Eretmotus sociator*, Fairmaire, from Algeria. *Hetærius acutangulus*, Lewis, *H. arachnoides*, Fairmaire, *H. ———*, n. sp., *Eretmotus tangerianus*, Marseul, from Morocco. *Hetærius hispanicus*, Rosenh., *H. Marseuli*, Brisout, *Eretmotus ibericus*, Brisout, from Spain. *Hetærius ferrugineus*, Oliv., from France.—W. W. FOWLER, *Hon. Sec.*

OBSERVATIONS ON COCCIDÆ (No. 1).

BY ALBERT C. F. MORGAN, F.L.S.

In offering a few observations on the group of insects included in the family of *Coccidæ*, I am much indebted to Mr. Douglas for his unremitting correspondence on the subject, and for the numerous specimens with which he has furnished me, and I should also thank Professor Comstock for his valuable and kind assistance.

I propose now merely to glance at the different forms of scales secreted by one of the sub-families into which the group has been divided, viz., the *Diaspinæ*. Before, however, entering into this part of the subject, it may be desirable to make a few general introductory remarks.

The most useful works upon the subject will, I think, be found to be Signoret's "*Etudes sur les Coccides*," first published in the "*Annales de la Société Entomologique de France*," 1868—1876; Comstock's Reports to the U. S. Agr. Dept. for 1880 and 1883; and Maskell's "*Coccidæ of New Zealand*." Targioni-Tozzetti's "*Studii sulle Cocciniglie*" deals more particularly with the physiological part of the subject, besides which he published a second "*Memoria*," with Catalogue attached, which, however, does not give a description of the species. Additional valuable information will be found in "*L'Entomologie Horticole*," by Boisduval; Fitch's first and second Reports on Noxious Insects; Harris' "*Treatise on Insects Injurious to Vegetation*." Reference should also be made to the general works of Réaumur, Geoffroy, Burmeister, and Westwood, likewise to papers by Ruricola (J. Curtis) scattered through the early volumes (especially 1843) of the "*Gardeners' Chronicle*," also to articles by Bouché in the "*Naturgeschichte der Insekten*" for 1834, &c., and in the "*Entomologische Zeitung*," 1844 and 1851. There are other papers on the subject mentioned in Signoret's list of the Bibliography of the *Coccidæ*, to which I have not had opportunity of referring. There does not appear to be any complete British work upon the subject.

Many of the *Coccidæ* are almost microscopical, or at least only noticeable by those accustomed to search for them, for they often very closely resemble the colour of the bark to which they are attached, but others are large comparatively. With the aid of a hand-lens much may be done, I think, in the way of collecting and determining the genus, as well as noting the food-plant, and even to a great extent studying the habits and life history of the insect. For a determination of the species, it is generally necessary to resort to the microscope, for which purpose it will usually be found convenient to subject the insect to the action of some re-agent, and subsequently to mount in balsam, after the usual preparatory treatment. I have also found slight staining useful in some cases. For microscopical treatment, the insects which have been preserved in the cabinet for a year or more, are equally serviceable with fresh specimens.

Some of the earlier writers (such as Burmeister) appear to have included *Aleurodes* with the *Coccidæ*, but I believe that it is now generally considered that the true Coccid has only one claw to the tarsus, that the females are apterous, whilst the males are dipterous, having besides the two wings two balancers, one on each side, terminated by a hooked bristle, which Comstock notices (Rep. U. S. A., 1880, p. 277) fits in to the hem of the wing, after the manner of insects

having four wings, such as the *Homoptera* and *Hymenoptera*. This fact might perhaps with some reason lead one to suppose that this club-shaped balancer is but the homologue of the posterior wing. The male insect in those species in which it has been observed is not provided with any mouth or buccal organs, in which respect it resembles the true male of *Phylloxera vastatrix*, belonging to the allied family of *Aphides*. The male *Coccus* is furnished with a remarkably developed, exserted, reproductive organ, this being often half as long as the insect itself. In place of the mouth are two large eyes, each protected by a stout spinal hair, and which are, in addition to the usual eyes, on the upper-side of the head. In many species the male has not been observed, and it has been supposed that the reproduction is agamic, which is perhaps not surprising, considering the similarity in many other respects between the allied families of *Coccidæ* and *Aphides*. The female, as it approaches the adult state (referring especially to the *Diaspinæ*), shows, like the male, remarkable powers of adapting itself to its circumstances or requirements, either by the degeneration of one part or the elaboration of another. As the chief functions of the male appear to be sexual, the generative organ is remarkably developed, as we have already shown, whilst the buccal organs are completely atrophied, and apparently were transformed into organs of sight; whilst the functions of the female being to reproduce, and its large heavy size when gravid rendering it almost impossible to move, the antennæ and legs are completely suppressed in the adult state, and the oral setæ are extraordinarily developed, these being frequently some six times or more longer than the insect itself, and enabling the insect, as I suppose by their means, to pierce the stomata of the plant, and thus find a way to the cell-contents of the leaf or bark. These setæ must also be useful to the insect in preventing it being blown off its site by the wind or other cause, for I have frequently found them suspended by the haustellum, and I have sometimes experienced considerable difficulty in removing them, owing to the firm hold of the leaf afforded by the setæ. This circumstance is also noted by Mr. Buckton (*Brit. Aph.*, vol. i, p. 17) with regard to *Chermes laricis*.

The family of *Coccidæ* (*Homoptera*) have been divided by Signoret, Comstock, &c., into four sub-families, viz. :—

- (i). *DIASPINÆ*: forming scales under which the insect lives.
- (ii). *BRACHYSCÆLINÆ*: living in galls, but not known in Europe or North America.
- (iii). *LECANINÆ*: } either naked or enclosed in a waxy filamentous or
- (iv). *COCCINÆ*: } spumous covering.

The last two sub-families are divided according to the formation of the anal characters, but it will be more convenient to describe these in detail on another occasion, when I propose to offer some observations on the differential characters of the terminal segments from a comparative point of view, with reference to the whole family, and I will therefore now merely submit a few remarks with reference to the *Diaspinæ*, and especially in regard to those filamentary secretions which are usually termed the scales. The glandular organs with which the insects are provided for secreting the scale material, I propose to describe when treating of the terminal segments and the organs peculiar to them.

The scales of the *Diaspinæ* are usually of a filamentary nature, occasionally weaved up together with what appear to be small portions of the bark of the food-plant; for example, the scale of *Aspidiotus ostreæformis* has this appearance. The colour of the scales is usually of a whitish hue, sometimes snowy-white, sometimes an ashy-grey. It may here be mentioned that besides the scale properly so called, and which is on the dorsal side of the insect, many species have a ventral scale, which appears to be of a similar nature to the dorsal scale. In some cases (*e. g.*, *Aspidiotus nerii*) it is a mere film observed on the leaf or bark after removing the insect. In other cases (*e. g.*, *Aspidiotus rapax*) it adheres to the insect when this is removed, so forming a complete covering to it on the ventral side. The form of the scales is variable; they may be either circular or linear, or may represent various modified shapes ranging between the two. When the scales are round, the exuviae are usually situated in the centre, but at the end when they are linear, in other words, when the scale is circular it is spun all round the insect, and when it is linear it is spun only at the posterior end; and, judging from the shape of some, *e. g.*, *Mytilaspis pomorum* (fig. 4), I am led to suppose that the scale is gradually pushed outwards, so that the most posterior part of the scale of *Mytilaspis* would thus have been the first to have been spun.

Professor Comstock mentions (Rep., 1880, p. 279) that some species do not shed their first skin until they have already commenced to secrete their scale, in which case the first larval skin cannot be observed, as it becomes covered by the secretion. In other species the larval skin is shed before the commencement of spinning, and it is then plainly visible either in the centre of the scale as in *Aspidiotus nerii* (fig. 6), or at one extremity as in *Mytilaspis pomorum* (fig. 4). It will be remembered that the female casts its skin twice, and the male only once. As a rule, the male scales are more elongated than

those of the females, and are often considerably smaller, besides being frequently of a purer white. For instance, the female scale of *Aspidiotus ostreæformis* is more or less circular, and of an ashy-grey colour, resembling, as regards shape, that of *A. nerii* (fig. 6), whilst the male scale is of an oval shape (see fig. 5). The female scale of *Aspidiotus zonatus* is circular, whilst the male is an elongated-oval (see fig. 3). Again, the female scale of *Diaspis ostreæformis* is more or less circular, in shape and colour much like the *A. nerii*, whilst that of the male is small, linear, and snowy-white, as shown in fig. 2. In some species (*e. g.*, *Mytilaspis pomorum*) the male scale differs from the female only in being smaller, and in having one instead of two exuviae.

Fig. 4 represents the scale of the female *Mytilaspis pomorum*, found in abundance on the bark of apple, plum, &c., kindly sent me by Mr. Douglas, and which was much covered with "rust" and secretion, so that the second larval skin could not be seen; but since making the drawing, I have found some of the same species on the *Calluna vulgaris* in this locality, which showed more plainly the second skin, of a brown-russet colour. The scale of this species is of a dark colour, shiny, almost resembling a steel-blue. In the genus *Uhleria*, Comstock (= *Fiorinia*, Targioni-Tozzetti) there is but little scale, the first larval skin lying quite at the extremity of the second, which is very large, and this is merely skirted all round with a white filamentous belt, which is in fact the scale.

Fig. 1 represents the type of this genus, viz., *Uhleria camelliae*, Comst., which is very closely allied to, and may possibly prove identical with, the *Fiorinia pellucida*, Targ.-Tozz. The insect itself lies under the second larval skin, and in this species is only about half the length of the second skin. It is not unusual in many species to find the adult insect considerably smaller than the second skin, and perhaps in this way it finds itself better protected from cold and other external enemies. In those species where the first larval skin is situated anterior to the scale, the antennae of the first skin are usually found distended, as shown in figs. 1 and 2; and although I have not observed this in the case of *Mytilaspis pomorum* (fig. 4), it will be found in some of the other species of this genus (*e. g.*, *M. pandani*). I have never observed this feature in those species in which the exuviae are situated within the limits of the scale. As has been observed above, the eyes, legs, and antennae of the *Diaspinæ* (with possibly one or two exceptions) are disposed of after the first stage of the insect's life, but the second cast skin may always be distinguished from the real insect by the position of the haustellum, which, in the cast skin, is almost

invariably dragged down towards the posterior end. I mention this, as after microscopical preparation it would not be otherwise always easy to be sure that the real insect was under examination.

The forms of the scales have been made the basis of the generic characters, and although, as I have mentioned, they vary considerably, there appears to be to some extent an evolutionary principle, which may guide us a little in tabulating the different genera.

I think it will be found—

- (i). That the male scales always have a *tendency* to the linear form, even although the females of the same species are circular (*e. g.*, *Aspidiotus*).
- (ii). That this *tendency* to a linear form on the part of the male has, in some species, developed, and become a sexual constant character, the female remaining circular (*e. g.*, *Diaspis*).
- (iii). That in some species this linear *tendency* appears to have extended to both sexes, but the scale has assumed a compromise between the circular and linear, *i. e.*, an elongated circular or mussel-shape (*e. g.*, *Mytilaspis*).
- (iv). That in some species the linear tendency has developed and become common to both sexes, but whilst constant in the male, the female is liable to variation (*e. g.*, *Parlatoria*).
- (v). That in some species the same character has become still more nearly constant in both sexes, the female, however, frequently showing a tendency to a compromise between the circular and linear form (*e. g.*, *Chionaspis*).
- (vi). Lastly, that the linear form has been definitely assumed by both sexes (*e. g.*, *Uhlaria*).

Putting these observations in a tabulated form, we have—

Aspidiotus, ♂ & ♀ circular; ♂ tends to linear form.

Diaspis, ♀ circular, ♂ linear.

Mytilaspis, ♂ & ♀ elongated-circular, or mussel-shaped.

Parlatoria, ♀ variable, sometimes circular, sometimes elongate; ♂ linear.

Chionaspis, ♂ linear and ♀ elongate, but ♀ sometimes much rounded.

Uhlaria, ♂ & ♀ linear.

I have given above only those six genera which appear to be accepted as definite, and which depend for their determination upon the formation of the scales. The two genera, *Parlatoria* and *Chionaspis*, appear to be very closely allied, but I have not yet had an opportunity of examining specimens of either, and I have, therefore, taken their characteristics from Prof. Comstock's description. Although the characters on which the several genera have been established seem to be sufficiently constant for the purpose, yet, as might be expected, some species of the same genus show a greater inclination than others to assume the characters of another genus. For example, the male scale of *Aspidiotus ostreaformis*, which, when fully adult, possesses a scale very much more developed posteriorly than is shown in fig. 5

(which represents a rather young form), shows a remarkable likeness to a young *Mytilaspis*. I may here remark, that I have found very crowded colonies both of the *Mytilaspis pomorum* and *Aspidiotus ostreæformis* heaped together in a confused mass on the same plant, viz., apple, plum, and cherry tree, received from Mr. Douglas, and I notice that Prof. Comstock (*op. cit.*, p. 313) significantly remarks that the genus *Chionaspis* resembles *Diaspis* in the form of the scale of the male, and *Mytilaspis* in that of the female. It must also be remembered that the winged males of the different genera are remarkably similar, although they present some difference in the size of their relative parts, as will be seen on reference to Comstock's figures (pl. xxi, Comst., Rep. U. S. A., 1880).

The possibility of cross breeding amongst some of the different genera is perhaps suggested by these facts, viz. :—

- (i). Crowded colonies of different genera on the same food-plant.
- (ii). Great similarity of winged males, which, if not conducive to, would not be preventive of cross breeding.
- (iii). Some of the differential characters of the scales, as shown in the table, appear to be such as might be produced by inheritance from cross breeding.

The figures given in Plate I are intended to represent some of the typical scales of different genera, and are *fac similes* of the drawings, which, as regards shape and size, were made by means of Wright and Newton's microscopic projecting apparatus. It will be understood that the insects living under the scales are not visible in the figures.

EXPLANATION OF PLATE I.

Fig. 1.—*Uhlaria camelliae*, Comstock. ♀, showing first and second exuviae, the latter carinated, skirted by a white scale.

Fig. 2.—*Diaspis ostreæformis*, Sign. ♂, showing cast skin and scale, the latter slightly carinated.

Fig. 3.—*Aspidiotus zonatus*, Frauenf. ♂, showing white scale, with a slight tendency to carination, and the larval skin slightly cephalically placed.

Fig. 4.—*Mytilaspis pomorum*, Bouché. ♀, showing first cast skin and large mussel-shaped scale. The second cast skin cannot be distinctly seen, as in the specimen drawn it was covered with secretion.

Fig. 5.—*Aspidiotus ostreæformis*, Curt. ♂, not yet adult, showing larval skin, towards extremity of the scale, the latter being of an oval form.

Fig. 6.—*Aspidiotus nerii*, Bouché. ♀, showing the two exuviae and circular scale.

N.B.—The above figures are all magnified $\frac{100}{3}$ diameters.

Fig. 7.—Leaf of oleander, attacked by *A. nerii* (natural size).

Villa Nova da Gaya, Portugal :

June, 1888.

1



2



3



6



5



7





A WEEK IN JERSEY.

BY R. C. R. JORDAN, M.D.

From August 21st to August 28th, 1886, I was in Jersey, landing on the morning of Saturday, August 21st, and leaving on the evening of Saturday, August 28th. As the ground was new to me, I worked hard in collecting both plants and insects; the following species of *Lepidoptera* were taken by me; all, common and rare alike, are equally recorded:—

Pieris rapæ. *P. brassicæ*: a large number of the pupæ of this insect were found against the wall of a cabbage garden near St. Aubyn's, and though some were affected by the usual parasite, a much greater number had fallen victims to a large ichneumon, making its exit by a single round hole.

Colias Edusa: not very common, but one or two seen every day; two caught.

Polyommatus Phlæas.

Lycæna Icarus: remarkably fine, and very variable, both in size and intensity of colour. *L. Medon*.

Vanessa urticæ: constantly on a large bush of red Valerian close to the house where I was staying. *V. Atalanta*.

Epinephele Janira: nearly over. *E. Tithonus*.

Satyrus Semele: remarkably abundant, and varying much in size, but none large.

Pararge Megæra. *P. Aegeria*: abundant in the interior of the island, not seen by the coast.

Cænonympha Pamphilus: abundant.

The day before leaving the island I received from a botanical friend a letter of introduction to M. Piquet, of St. Heliers, with the remark, "he knows every plant in the islands;" I found that he knew much about the insects also, and from him I received *Pieris Daphnidice*, ♂ ♀, with the remark that it was not rare amongst *Reseda*, and occurred twice in the year, May and August; also a pair of *Argynnis Lathonia*, taken in the island, and also said not to be of rare occurrence. It would be easy to point out deficiencies in my list, *Pieris napi*, *Vanessa cardui* and *Io must* occur, but the record is of captures only; of course, my attention was directed towards any facts which might prove the truth of the late Mr. Wollaston's views with regard to the size of island insects, but the season was very dry, and this made the observations non-reliable, certainly some specimens of unusually small size were caught; for example, *S. Semele*, ♂, expanse, 39 mm.; the largest ever taken by me being in the Visp Valley: ♀, exp., 62 mm.; ♂, 58 mm.

Smerinthus populi: larva.

Macroglossa stellatarum: imago seen, larva found.

Zygæna (*sp. incerta*): empty cocoons were met with in two places, at Corbières, and at St. Ouen.

Here again M. Piquet gave me two specimens of *Deilephila euphorbiæ* reared from larvæ found on *Euphorbia portlandica*, near St. Ouen. I was not myself successful in finding any, but only one short visit could be paid to the spot.

Lithosia caniola: two specimens, at Corbières, evidently attached to the lichens on the rocks facing the sea. *L. griseola*: several, beaten from the cork elms on the shore near St. Aubyn's; the branches were covered with lichens.

Callimorpha Hera.

Euchelia jacobææ: the larvæ were common on plants of *Senecio jacobææ*.

Cases of a species of *Fumea* were common.

Bryophila glandifera and *B. perla* were both common on rocks and walls; *glandifera* the finest and most frequent.

Agrotis puta, *xanthographa*, *pronuba*, *janthina*, *orbona* (*comes*).

Miana bicoloria (*furuncula*): only one poor specimen taken.

Mamestra brassicæ: larvæ.

Phlogophora meticulosa.

Plusia gamma.

Hypena proboscidalis.

I used no sugar, and only worked in the day, or my list of *Noctuæ* would probably have been longer.

Acidalia subsericeata, *aversata*, *incanata* (*marginepunctata*), very common, *dilutata*, *lividata*.

Abraxas grossulariata.

Rumia cratægata (2nd brood).

Aspilates ochrearia (*citraria*): very abundant, but the specimens all small; ♂, exp., 26 mm.

Ortholitha peribolata: of this species I took five specimens, and saw two or three more, on the tract of broom and furze by Corbières.

Mesotype virgata (*lineolata*): St. Ouen.

Cidaria galiata: the commonest Geometer in the island. *C. fluctuata*, *bilineata*.

Eupithecia pumilata.

Endotricha flammealis.

Scoparia ambigualis, *frequentella*.

Botys purpuralis, *cespitalis*, *ferrugalis*, *ruralis* (*verticalis*), *fulvalis*.

Pionea forficalis.

Crambus inquinatellus, *geniculeus*, *culmellus*, *tristellus*, *selasellus*: St. Ouen.

Mimeseoptilus serotinus.

Acipitilus pentadactylus.

Alucita hexadactyla.

Tortrix heparana.

Bactra pauperana.

Peronea variegana: small, curiously at St. Ouen, on the sand-hills, and far from any other vegetation that it could possibly feed on there was a patch of *Rosa spinosissima*, and on these bushes *P. variegana* was common.*

Dictyopteryx ciliana: common, but very small.

Carpocapsa pomonella: larva in apples. *C. ulicetana*: most abundant.

Eupæcilia rupicola: amongst *Eupatorium cannabinum*. This insect is common amongst the same plant at Teignmouth, and has been found by me at Sierre in the Rhone Valley, also amongst *Eupatorium*.

Cases of *Talæporia*, probably *inconspicuella*, were frequent amongst lichens.

Tinea biselliella: house, abundant. *T. nigripunctella*: one specimen on a wall in St. Heliers.

* From this plant being mentioned it had occurred to me that the moths must have been *P. permutana*, but on examining two of the specimens which Dr. Jordan captured on this occasion, I found that they were veritably *P. variegana*, only remarkably small.—H. T. S.

Hyponomeuta padella: common on hawthorn edges.

Plutella cruciferarum.

Cerostoma radiatella, *xylostella*.

Depressaria costosa, *atomella*, *arenella*, *Alstræmeriana*, *Yeatiana*, *applanata*, *nervosa*, *heracliana*.

Gelechia mulinella: the commonest Micro-Lepidopteron on the island.

Ecophora fuscescens, *pseudo-spretella*.

Argyresthia ephippella, *nitidella*, *albistria*.

Ornix finitimella or *anglicella*: common on hawthorn edges. *Ornix*: larva on sloe.

Coleophora argentula: larvæ and cases; abundant on *Achillea millefolium* heads, close by the station at Corbières.

Lithocolletis faginella, larva, beech; *messaniella*, larva, on *Quercus Ilex*; *pomifoliella*, larva, hawthorn; *trifasciella*, honeysuckle; (*sp. incerta*) larva, elm.

Nephtula aurella, larva, bramble; ———? hawthorn.

It will be seen that the list contains some species which need a few words of comment; these islands seem to be warm enough for such insects as *Pieris Daplidice*, *Argynnis Lathonia*, and *Deilephila euphorbiæ* to thrive and prosper on them, that is, if warmth be the element needed. *Lithosia caniola* is mentioned as a native of Jersey for the first time, it is an interesting link in the chain of maritime localities, connecting the Irish locality with the continent, *e. g.*, Pembroke, Dartmouth, Jersey. Dr. Staudinger tells me it occurs in Normandy. *Ortholitha peribolata*, a handsome Geometron, reminding the captor at first sight of a large *Celma imbutata*, is also recorded as a native of Jersey here for the first time: though in one list *Ortholitha vicinaria* was said to occur, a very improbable insect, and *peribolata* was in all likelihood mistaken for it. Dr. Staudinger says that it is also met with in Normandy.

Botys fulvalis is one of those insects recorded as British by Stephens, and it is figured in Wood, though the figure is not recognisable; three specimens were captured, and a fourth seen, in totally different parts of the island, so that it had a wide distribution. Its occurrence in Jersey was not before known.

Although fully admitting that the Zoological relationship of these islands belongs to Normandy rather than to England, yet considering how thoroughly their Botany has been worked out by Prof. Babington, it is not too much to hope that British Entomologists may at some future time give us as good a Manual of their insect inhabitants; enough has here been said to prove that the mine is not yet exhausted.

The scheme that I would propose is this: that a committee of our working entomologists be formed for the thorough investigation of all

Orders of insects inhabiting the channel islands; that M. Piquet, of St. Heliers, be asked to become its Honorary Secretary; that a free interchange of specimens should take place between our fellow-workers in these islands and ourselves—it must be remembered that they have the same postal laws, and are under the same postal arrangements as England, which facilitates the plan; at the close of every year, a list of all fresh species (to include the very commonest) should be published, but that *no insect whatever* should be so recorded without its thorough examination by a London committee appointed for the purpose: this is necessary to avoid errors, nobody ought to be hurt by such a proposal: for my own part, in this and in many other papers, I have been only too glad to avail myself of Mr. Stainton's kind aid in naming the *Tineæ* of the list, as well as help from other Entomologists when it has been needed.

105, Harborne Road, Edgbaston,
Birmingham: May 28th, 1888.

NOTES ON THE SYNONYMY OF CERTAIN BRITISH *LEUCANIIDÆ*

BY J. W. TUTT, F.E.S.

Nonagria extrema, Hb., *concolor*, Gn., and *fulva*, Hb.

In working through our *Leucaniidæ* I have had to pay a great deal of attention to the synonymy of some of the species. On going through Hübner, I find I made the following note about his figure 412 (*extrema*), "Wings about the same shape as *Bondii*. All the wings white, slightly shaded to ochreous on the outer margins, nervures slightly darker on outer edge; anterior wings with traces of a transverse row of spots. The upper part of the fringe of the anterior wings black; remaining fringes grey." It is totally unlike any of our British species, unless it is a peculiar form of *Bondii*. None of our *Nonagriæ* or the allied genera have the upper part of the fringes black, so this character may be thrown out.

Guenée, in his "Noctuérites," p. 103, treated it as a distinct species from *concolor* of Guenée, and having inspected the Doubleday specimens of the latter species, I think he was very wise to do so. I cannot see the slightest reason for supposing them to be alike.

Staudinger, in his Catalogue, p. 107, treats Guenée's *concolor* as a variety of *extrema*, Hb., 412, adding to the latter *ab.*, meaning, I suppose, that his figure (Hb. 412) is an aberration, although being the first figure it must be the type. He also adds after *concolor*, Gn. i, 103, the word *certo*. I fail entirely to see why *certo*, to me it seems uncertain or rather impossible.

Turning to the Ent. Mo. Mag., vol. iii, p. 257, we have some remarks by Mr. Doubleday, a quotation of Treitschke to Zeller, and one from Zeller to Doubleday, as to the probability of *Bondii*, Kngs., not being *extrema*, Hb., and the certainty (based on Treitschke's statements after he had seen the originals of Hübner's *extrema*) that *Bondii* was a distinct species. Whether this is so or not none of us can say, unless we can see the type; but as Guenée, Staudinger, &c., take this view as correct, the name (*Bondii*) will stand, irrespective of fig. 412, Hb., which to me seems nothing but a badly figured *Bondii*.

But with regard to Dr. Staudinger's conclusion that *concolor*, Gn., = *extrema*, Hb., I disagree entirely, and I fail to see how (if Dr. Staudinger saw English specimens) he came to this conclusion. *Extrema*, Hb., may not = *Bondii*, Kngs., but it is still more certain that the former does not = *concolor*, Gn.

With regard to the latter species (*concolor*), I believe that all the specimens in continental collections are British, certainly those that Guenée named the species from were British, and came from Mr. Doubleday, for he says, "England, in the commencement of June. Still rare;" and this is his only locality (Guenée's "Noctuélites," vol. v, p. 104).

Mr. Doubleday's explanation of Herrich-Schäffer's fig. 337 shows that this was probably drawn from an English specimen (Ent. Mo. Mag., vol. iii, p. 257). This figure, in accordance with his views of *extrema*, Hb., Dr. Staudinger refers to that species. As Mr. Doubleday remarks (Ent. Mo. Mag., vol. iii, p. 257), "If the above quoted statement of Treitschke (who saw the original *extrema*, Hb.) is correct," *i. e.*, his description as quoted in the above mentioned extract, "then *concolor* cannot be *extrema*." Therefore I think, on Treitschke's showing, Staudinger's nomenclature must be wrong, and that Hübner's *extrema* certainly is not our English *concolor*.

Now with regard to *concolor*. I believe the species has not been captured for some years. I have seen the Doubleday specimens, and could never understand why they were not an extreme form of *fulva*. During July, 1885, 1886, and 1887, I captured, in the first and second weeks of that month, one or two specimens each year, which are Doubleday's and Guenée's *concolor* undoubtedly. I have only six in all, two are a most perfect reproduction of Guenée's description of the type, in fact, he might have written his description from them, it describes them so perfectly.

Dr. Staudinger gives as localities for *extrema*, Hb., which he says

= *concolor*, Gn. (*i. e.*, from my point of view for the two species), in his Catalogue, p. 187, "Germ., c. et m. oc. (olim); Anglia (olim); Austr.; Hung."

I suppose it is on the strength of Lederer's Vienna specimens that we get "Austria and Hungary," and on the strength of Hübner's type we get "Germany (olim)." As these latter would necessarily refer to *extrema*, they may be disregarded, and it leaves us with the Austrian and British specimens. The Austrian specimens may have been *concolor*, and the same as the British specimens, or they may have been *extrema*, in which case I consider them a distinct species to ours. Even on Dr. Staudinger's nomenclature they must have been one or the other, and either way do not affect the consideration of our British specimens.

"Anglia (olim)." I think the *olim* might come out now, as I can get this form at Deal. I dare say it is taken in the fens, but is not known, as *concolor* is unknown, except by name, to any but the oldest of our Lepidopterists.

I have previously stated that my *concolor* = those in the Doubleday collection, and that Guenée's were described from some of the latter, that is, direct from the Doubleday collection, or from some Mr. Doubleday sent or gave to M. Pierret.

Guenée saw that our species was more likely to be confounded with *fulva* than with anything else, for he adds ("Noctuérites," vol. v, p. 104), "This *Nonagria* is certainly distinct from *fulva* as much by its special characters as by the time of its appearance."

Now, first, what are its characters ("Noctuérites," vol. v, pp. 103 and 104):—

(1) Superior wings, "at the outside margin, straighter at first, then more rounded than those of *fulva*." With regard to this character, I need hardly point out to those who have a long series, that the shape of the anterior wings of *fulva* differs much *inter se*.

(2) "Of a whitish bone colour in both sexes, lightly powdered with grey at the ends of the spaces between the nervures, and developed into indistinct dark streaks." This latter character occurs in almost every specimen of *fulva* that has come under my notice, and some of my specimens are as pale as Doubleday's *concolor*.

(3) "A series of black spots, always distinct though badly expressed, in the place of the angulated line." Probably "though faintly marked" was what Guenée intended by "quoique mal exprimés." This seems to be the most distinct point of difference, but many *fulva*

in my series have the row of dots marked, and one specimen out of the six *concolor* I have has the spots absent. Herrich-Schäffer's fig. 337, which Doubleday states (Ent. Mo. Mag., vol. iii, p. 257) "was probably taken from one of my (Doubleday) specimens," is stated by Newman, in his "British Moths," p. 275, to be "without the transverse series of minute dots." This shows that Doubleday himself did not consider the character vital.

The remainder of Guenée's description would answer very well for all pale specimens of *fulva*.

The time of appearance presents a slight difficulty. Newman and Guenée both give June. My specimens were captured between July 4th and 12th. I have taken typical *fulva* occasionally at the end of July in other localities, and probably the species is double brooded in sheltered localities, the first brood being rare.

My conclusions, therefore, based on the above, are as follows:—

(1) That *concolor*, Gn., is distinct from *extrema*, Hb.

(2) That *concolor*, Gn., is a local, pale form of *fulva*, Hb.

If any of our older Lepidopterists would prove the above views wrong, I should be greatly obliged to him; or if any one who knows anything about the old British *concolor* agrees with these statements, I should like to know.

Cænobia rufa, Haw., = *despecta*, Treit., Hb.-Geyer.

In Stainton's "Manual," and the Doubleday List, this species is known as *despecta*. In Newman's "British Moths," and Staudinger's "Catalogue," it is called *rufa*. Mr. South, in "The Entomologist" List, has followed the latter; whilst Guenée, in his "Noctuélites," uses *despecta*, giving Haworth's *rufa* as a synonym with doubt. Mr. Robson, in the list he has published in the "Young Naturalist," appears to have followed Guenée's synonymy.

The description of Haworth's *rufa* ("Lepidoptera Britannica," p. 260) is as follows:—"alis oblongis ciliisque rufis unicoloribus; posticis ciliisque pallidis striga medio macularum obscurarum." I consider this a good description of the insect we get. Haworth then goes on, "caput inter antennis album." I have a very long series, and this statement can readily be verified if one turns the drawer round with the heads of the insects towards one, and looks down the series from top to bottom. The head is "between the antennæ" decidedly "white." Haworth then goes on, "Lingua et palpi Noctuarum, potius quam Bombycum," of which I suppose its position in our classification is a sufficient proof. Comparing it with *lutescens*, a

variety of *Acosmetia caliginosa*, Haworth goes on to say, "Corpus paulo gracilius quam in ultimo (*lutescens*) et alæ magis oblongæ." Both *lutescens* and *rufa* are slender bodied *Noctuæ*, and were formerly by our older British authors classified together in the genus *Acosmetia*.

There is no doubt, I think, that the synonymy should stand as:—

rufa, Haw., 1803, Newm., Stdgr.

despecta, Tr., Hb.-Gey., Sta., Guenée.

Leucania unipuncta, Haw., = *extranea*, Gn.

There seems to be no doubt that the latter name, which is in use in all our books and lists, will have to give way to Haworth's earlier name. Haworth's description ("Lepidoptera Britannica," p. 174, No. 37) is very distinct:—"Alis rufescentibus seu griseo atomosis, lineola obliqua fusca apicis, punctoque minutissimo albo basi stigmatis postici. Stigmata ordinaria fere omnino oblitterata." In Guenée's original description of *extranea*, which is much longer, the only point of difference is that he lays more stress on the species being more strongly powdered with black scales (*vide* Guenée's "*Noctuélites*," vol. v, pp. 77 and 78). Any one who will compare Haworth's description with that of Guenée, or with that in the "*Entomologist*," vol. xxi, p. 138, will, I believe, be at once convinced of their identity.

The synonymy should therefore be:—

Leucania unipuncta, Haw., 1803.

extranea, Gn., Newm., Stdgr.

Nonagria neurica, Hb., = *arundineta*, Schmidt.

In Stainton's "Manual," vol. i, p. 193, we find the Norfolk and Cambridge *Nonagria* in question described under the name of *neurica*. In Newman's "British Moths" it is described under the name of *arundineta*. Dr. Staudinger, in his "Catalogue," 1871, separates *neurica*, Hb., specifically from *arundineta*, Schmidt, and refers our British specimens to *arundineta*, which he treats as a variety of Treitschke's dark form *dissoluta*. I have been lately working at Hübner, and there is not the remotest doubt that our paler specimens are identical with Hübner's figure 381, *neurica*. Some of the specimens sent me by Mr. Warren are exactly like his figure, except in colour, which is dull brown and not reddish as in our forms, but there can be no doubt about its being our insect in its palest forms. Schmidt discriminates between his *arundineta* and Hübner's *neurica* as being "more robust" (a vague difference it seems to me), and the under-side spotted (*i. e.*, without a central spot on each wing). As Hübner

only figures the upper-side, I do not see that this distinction would hold, and I find that our palest specimens have practically no central spots on the under-sides, but that these spots which are absent in the pale forms gradually increase in intensity with the depth of colour on the upper surface. He also gives different dates for the appearance of his *arundineta*; but Mr. Warren (Ent. Mo. Mag., vol. xxii, p. 256) shows that *neurica* in Norfolk is a fortnight earlier than the same species in Cambridge. I believe the dark form (*dissoluta*) used to occur in the Norfolk and Cambridge Fens, but Dr. Staudinger himself groups *arundineta*, Schmidt, with *dissoluta*, Treitschke, and our species now gives us both *neurica*, Hb., and *arundineta*, Schmidt.

There can be no doubt, therefore, that the synonymy should stand:—

Nonagria neurica, Hb., Sta.

(a) var. *dissoluta*, Treitschke.

(b) var. *arundineta*, Schmidt.

Westcombe Park, S.E.:

June 10th, 1888.

NOTES ON SOME BRITISH AND EXOTIC COCCIDÆ (No. 9).

BY J. W. DOUGLAS, F.E.S.

LECANIUM LAURI.

Coccus lauri, Boisd., Ent. Hort., p. 353 (1867). *Lecanium lauri*, Sign., Ess. Cochen., p. 230 (1873).

♀. Long broad-ovate, or when alongside the midrib of a leaf, nearly straight on the side appressed to it, flattened, yellowish-brown; the middle portion of the disc, that is, over the insect beneath, with a median, blunt, slight elevation, of varying development; on each side of this, for some distance, the surface is deeply and coarsely punctured, the foveate punctures on their base, under the power of a half-inch objective, appear as large black perforations of the integument, but there is no reticulation or tessellation; exterior to this portion the wide field, up to the margin all round, is finely rayed transversely, and anteriorly has also on each side two distant, fine, yellow carinæ going obliquely from the punctured portion to the margin, these become more or less obsolete in the old examples, but then the median elevation mostly becomes sharper and more like a carina. Under-side glossy, greenish-yellow with brown shades, usually more decided on the sides of the abdomen. Antennæ slender, of 7 joints. Length, 3·5—3·8, breadth, 2·5—2·6 mm.

No male scales seen.

Signoret (*l. c.*) appears to doubt if this form be separable from *L. hesperidum*; and this is true as regards the young stage, where the likeness of one to the other is very great; but in the adult the broader form, the strong puncturing of the disc, and generally darker colour, seem to me to be of distinct specific value; moreover, while *L. hespe-*

ridum is found on orange trees and many other plants, *L. lauri* is attached exclusively to the bay tree (*Laurus nobilis*), which flourishes in this country, especially in the southern counties, in the open air.

On the 16th January last Dr. D. Sharp sent to me from his garden at Shirley Warren, Southampton, some terminal shoots of bay, on the leaves of which the scales of this species were numerous, and in all stages of growth; there were also a few on the stems. As a rule the scales were attached to the lower surface of the leaves, but a few were on the upper side, and all were alive and healthy—a rare thing with *Lecanium*, at this season, in this country. I think the females are viviparous, and that the species belongs to the (so-called) parthenogenetic set (*c. f.*, p. 25—27, vol. xxiv).

On the 9th of April, on a small bay tree here in Beaufort Gardens, I found a few scales; both adult with young beneath, and others of small size immature, indicating a progressive generation of the species, as in *L. hesperidum*.

LECANIUM CLYPEATUM, *n. sp.*

♀ scale in the early stages, and up to the time of gestation, narrow, pearl-white, with strong carinate ridges, viz., one on the middle of the back, crossed towards each end of the scale by a similar one extending at a right angle to the margin on either side, the spaces between the ridges, especially on the sides, very concave, as if by compression; the surface or hypoderm (as Targioni-Tozzetti has it) covered with minute pale dots; these become more evident when the scale gets brown, as it does eventually, the length being about 3·5 mm. In this ridged condition of immaturity the scales are void, but after the fertilization of the insects they become filled with eggs, the ridges disappear, the cavities fill up, and the form is a broad-oval, very convex, the dorsum with a row of 4—6 very small tubercles, sometimes two or three rows; sides more or less straight, the margin not extended and flattened, except anteriorly, as far back as the region of the primary lateral ridges, where it is greatly produced, clypeiform, in some examples to an obtuse point, mostly slightly recurved at the edge, and rough with strong punctures; sometimes also with a rough longitudinal median carina. Viewed from the side, the scale, in the region of the previous dorsal carina, is more or less level, but it then curves somewhat suddenly both to the front and back. When mature the scale is ochreous-brown, and slightly shorter than when immature. Under-side all pale; margin with fine, distant, horizontal hairs; antennæ of 8 joints; 1st and 2nd short, 1st shortest, 3rd longest, 4th and 5th a little shorter, 6th, 7th and 8th short with long hairs; legs short, tarsi nearly half the length of the tibiæ, articulation therewith distinct; claws short, digitules ordinary.

Length, 3—4, breadth, 2—2·5, height, 1·5 mm.

Male unknown.

In general appearance the adult scale resembles *L. flicum*, but differs from it in the absence of the flattened margin and in the presence of the clypeate extension of the margin anteriorly—a characteristic of the species.

I first obtained the white form, along with the mature scales, on *Adiantum capillus veneris* in the conservatory of Mr. W. Morris at Deptford, in April, 1887; and in February last I received some, on another fern, from Rev. W. F. Johnson, Armagh. I have also had the mature form from Mr. P. Cameron, Sale, on *Bryophyllum calycinum* and *Asparagus plumosus*.

LECANIUM BITUBERCULATUM.

Lecanium bituberculatum (Targ.-Tozz.), Sign., Ess. Cochen., p. 244.

♀ scale chocolate-brown or grey-brown, with yellowish tints in places, broad-oval, very convex, the upper part of irregular contour, with two pairs of dark, shining tubercles, each tubercle of a pair placed near to and in a line with the other, the posterior ones larger, more conical, darker, and more polished than the anterior; between the tubercles, on the median line, is a broad, flat ridge, which is continued forwards for some distance, and then ends abruptly at a large depression, from which, at a low level, a very fine raised line goes to the anterior margin: behind the tubercles the median flat ridge extends a little, and then merges into a slight carina, which goes to the anal cleft; this is long, fusiform, open, and the aperture has raised margins; the scale has a broad marginal field more or less freckled or banded with yellow or ashy-white, and with large confluent punctures; on the posterior portion of the sides of the scale this field is crossed by four or five short carinæ, and one, immediately below the larger tubercle, longer and stronger.

Length, 4·5, breadth, 3, height, 2 mm.

The specimens I have being dessicated I have to borrow from Signoret the description of the parts I am unable to see:—"The antennæ have 7 joints; the 4th being the longest, with four long hairs at the extremity; 5th and 6th the shortest, 7th a little longer, equal to the 3rd. Legs difficult to eliminate, twenty examples were destroyed before a view of an entire one could be obtained; tarsus one-third less than the tibia, with three hairs towards the end; claw rather broad at the base, with two digitules *en forme de cornet*.

"The ♀ larva has 6 joints in the antennæ, of which the 3rd is the longest. The ♂ larva is much longer, and has 7 joints in the antennæ, of which the 7th (very long and equalling the 4th) has four hairs at the end. The dorsal surface has very small and proximate cellular punctures, especially towards the margin."

The ♂ imago is not described. Of the ♀, Signoret says the scale is is very variable in size, sometimes attaining 5 mm. in length, 4 in breadth, and 3 in height, according to the circumstances of its position on a small or large site. His figure represents the dorsal tubercles as of nearly equal length, whereas his description states that two are smaller than the others; a lateral tubercle is also shown which is not mentioned in the description, and which I do not find; it is doubtless meant to represent the carina below the larger tubercle. The lateral carinæ are not figured nor described, the smaller ones are frequently not very evident, but the large one always is. But in all the main points my examples agree so well with Signoret's description as to leave no doubt of the specific identity of this remarkable form. It appears to be subject to some variation, for Signoret mentions that, on some of the specimens he received from Florence the anterior smaller tubercles were wanting;

others had on the disc an irregular pale yellow spot, more or less fimbriate, which he thinks may have been the result of the attack of parasites.

In his "Catalogus," p. 33, No. 18, Targioni-Tozzetti indicates "*Lecanium bituberculatum*, nob., *sp. n.*," but without description; under this name it was sent to Signoret, who described it, *l. c.*; he says of it, "*Ce Lecanium est un des plus jolis*," and states that it is common on whitethorn at Florence and in the South of France.

On February 15th last Mr. E. Parfitt sent from Exeter one, and on March 20th the other of the two scales described above, which he had just found on twigs of hawthorn (*Cratægus oxyacantha*) in a hedge; this is the first time the species is known to have been taken in Britain. On the 4th of April, on a hawthorn hedge at Lee, within a space of two yards, I found 24 scales of this species, always on shoots of last year's growth, sometimes singly, at others two or three close together, mostly at the base of a thorn or bud; but they were localized, for I sought in vain for more in other parts of the hedge.

Being very much of the colour of the wood, and not unlike the buds about to open, they might easily be overlooked, and I might not have seen them but that by having Mr. Parfitt's specimens I knew what to look for; when the leaves are out it would be as much as a bird or a parasitic insect could do to find the scales. But no bird cares to molest them, or it would have attacked them in their unprotected condition during the winter, and the parasite, if there be one, is already within the shell. I observe that there is in the scales a certain range of variation in form and colour, and the small tubercles (which are at times behind and not before the large ones) are often wanting; but the distinctive characters of this remarkable scale are always present. On the under-side the margin all round is greatly widened inwardly, forming a broad, flat ledge for adherence to the site, a provision against the roughness of winter, most advantageous to scales containing the germs of the next generation. As a rule, the female scales of the *Lecania* in general fall off after the larvæ have come out from them in the summer, and the few that may happen to remain during the winter are slightly attached, empty, dull and tarnished, but these of *L. bituberculatum* after hibernation are tightly adherent, fresh and bright, and contain each 200 to 250, or more, loose, plump, pale yellow eggs. It is quite possible that these may produce a summer brood, from which the scales to be found in the spring may come; but this is only theoretical.

8, Beaufort Gardens, Lewisham:

April, 1888.

ANOCHETUS GHILLANII, SPIN., ♀?

BY EDWARD SAUNDERS, F.L.S.

Hitherto only workers of this curious ant have been known, and they have occurred but rarely. Mr. Walker, however, as recorded on p. 17 of the current volume of this Magazine, took it in some numbers both at Tangier and Gibraltar, but also only in the worker sex. Mr. Geo. Lewis, while at Tangier, had the good fortune also to meet with it, and obtained some large specimens with unusually long bodies, which he took to be females; of these, he tells me, he found one, as a rule, in each nest, and on one occasion only three. He kindly gave me the specimens, and, on examination, finding the ocelli distinctly visible, whereas in the worker they are absent, I felt little doubt that they were true females, although they appeared to differ from the worker in nothing else but size. I communicated one to Dr. Emery, of Bologna, and he writes that he doubts if it can be called a true female: that he knows the female of *A. Mayri* (a neotropical species), and that that has rudimentary wings, and he would rather suggest that these may belong to a form intermediate between the worker and female, and adds that he thinks it possible that the true female may not exist. At any rate, the discovery is one of great interest, for which we are much indebted to Mr. Lewis.

As little is known of the habits of this strange creature, I add some remarks communicated to me by Mr. Lewis:—"The *Anochetus* constructs galleries under stones on the stiff clay slopes behind the town of Tangier (the slopes which are noted for the very remarkable beetle fauna found on them). The communities are not large, and are found generally on one side of a stone near the edge; often another species of ant occupies another part of the under surface. The ants are sluggish, like *Ponera*, and they lie close together, so that five or six may be taken on a wetted finger. The female was rare in March and April, and I usually only saw one in a nest, but once I saw three. The females are noticeable at once by the length of the abdomen. I think I took nearly all the females I saw, and you have them all. I have never seen any larvæ, and, therefore, cannot judge whether the *Histeridæ* go after them. The curious form of the species attracted my attention, but I did not know it was of special interest to any one until Walker told me when I saw him at Gibraltar."

St. Ann's, Mount Hermon, Woking:

July 10th, 1888.

DESCRIPTIONS OF THREE NEW SPECIES OF *LEPIDOPTERA*-
HETEROCERA.

BY HERBERT DRUCE, F.L.S.

Fam. CHALCOSIIDÆ.

HISTIA, Hübn.

HISTIA DOLENS, *n. sp.*

Primaries dull black-greyish at the base and along the inner margin; a white band crosses the wing from the costal margin beyond the cell to near the middle. Secondaries dull black-greyish from the base to the end of the cell, beyond which is a whitish spot. The under-side of all the wings as above. Head and collar reddish-brown. Thorax and abdomen on the upper-side black; the anus and the under-side of the abdomen reddish-brown. Antennæ and palpi black; legs greyish.

Expanse, 2 inches.

Hab.: Celebes.

Mus. Druce.

Fam. ZYGÆNIDÆ.

BELEMNIA.

BELEMNIA WHITELEYI, *n. sp.*

Primaries the same as in *B. Jovis*, with the apical band pale cream colour, instead of bright carmine. The secondaries very bright *morpho-blue*, narrowly shaded with black from the apex to the inner margin. The head, collar, and a spot on each of the tegulæ, pale metallic-blue; the thorax and the upper-side of the abdomen dark bronze-green, the sides of the abdomen metallic-blue, the under-side bright carmine. Antennæ and palpi black; legs greenish-black.

Expanse, 2 inches.

Hab.: British Guiana.

Mus. Druce.

This very fine species was discovered by Mr. Whiteley, after whom I have much pleasure in naming it. It is allied to *B. Jovis*, Butler, but is a much more beautifully coloured species.

Fam. EUSCHEMIDÆ.

MILIONIA, Walk.

MILIONIA PRYERI, *n. sp.*

Primaries dull brownish-black; the veins from the base almost to the middle shot with brilliant bluish-green. A dull, chrome-yellow, band (widest on the costal margin) crossing from about the middle to the inner margin on the basal side of the anal angle, where it becomes quite narrow. Secondaries brownish-black, with the outer margin from the apex to the anal angle broadly bordered with chrome-yellow; the veins shot with blue, as in the primaries. Three large confluent black spots close to apex, and three oval spots on the outer margin, the one nearest the anal angle is the smallest. The under-side of all the wings the same as above, excepting that it is paler and more dusky in colour. Head, thorax, and abdomen dark glossy blue, the segments edged on the lower margin with bright blue. Antennæ and palpi black.

Expanse, 3 inches.

Hab.: Loo Choo Islands (Pryer).

Mus. Druce.

I have named this fine species after its discoverer, the late Mr. Pryer; it is allied to *M. Zonea* and *M. pyrozonis*, but very distinct from either.

London: July, 1888.

DESCRIPTION OF A SPECIES OF *EPISCHNIA* (*BANKESIELLA*)
NEW TO SCIENCE, FROM PORTLAND.

BY NELSON M. RICHARDSON, B.A.

About the middle of July, 1887, Mrs. Richardson and I each took at Portland, on the same evening, a specimen of one of the *Phycidæ*, which we did not recognise, and which has turned out to be not only new to Britain, but also to science.

I first sent the moths (a ♂ and ♀) to Mr. Stainton, who has most kindly helped me to identify my specimens on several occasions, but he returned them as being unknown to him. I then sent them to Mr. C. G. Barrett, who has also assisted me before in the same way, but he also failed to recognise them, telling me, however, that they came near to *Epischnia prodromella*. He kindly offered to send one of my specimens to M. Ragonot, at Paris, which offer I gladly accepted; a short time ago M. Ragonot returned it to Mr. Barrett, saying that, in his opinion, it was new to science.

I am sorry to say that I have taken no more specimens this season, and as the male which was taken last year was worn, showing that it had been out for some time, I do not think that I am likely to come across it until next year at all events.

The moth may be described as follows:—

The expansion of the wings in the ♀ is 1" 1''; in the male it is slightly less. The breadth of the fore-wings is almost exactly one-third of the length. The costa in the male is regularly curved; in the female it is much curved at the base, and less so near the tip, whilst the intermediate portion is nearly straight. The tip is blunt, and the hind margin convex. The colour of the fore-wings is light cinereous-grey, clouded with dark grey, especially on the basal half of the wing. There is an inconspicuous, narrow, light greyish-ochreous patch extending about one-third of the way along the inner margin. The veins are streaked with dark grey. Several dark grey lines cross the wing from the costa to the inner margin, but they are all very indistinct, and only traceable with difficulty, owing to the wings being clouded with the same colour. The most distinct are two lines, one of which starts from the costa near the middle, and runs towards the anal angle as far as the centre of the wing, where it turns nearly at right angles towards the base, and when at a short distance from the inner margin, turns again at right angles before it reaches it. This line is double at the costa, and the two branches gradually approach each other and meet on the inner margin. The other line is one which runs from the costa near the tip, parallel to the hind margin, to a point near the anal angle, where it turns sharply outwards to the anal angle. There are slight traces of two other lines, one between the two above mentioned, and one near the base, but it is difficult to follow their course, owing to the clouding of the wing.

A patch of the pale ground colour, less clouded than the rest, extends obliquely from the tip to the inner margin. The fringes are of the pale ground-colour, intersected by a dark grey line.

The hind-wings are very pale brownish-grey, with a darker shade close to the margin, the fringes still paler, almost white.

The head, palpi, thorax and antennæ are of the colour of the fore-wings, the thorax being the most clouded with dark grey; the body like the hind-wings.

The antennæ are about two-thirds of the length of the fore-wings, and simple in both sexes, though in the male they are a little thicker, and slightly curved at the base; the palpi are rather long (about $\frac{5}{8}$ "), porrected, rather ascending, thickly clothed with scales, except the last joint, which is narrower and more naked; eyes very dark grey.

This moth is very distinct from any other British species, but comes very near to *Epischnia prodromella*, H.-S., *E. illotella*, Z., *E. asteriscella*, Mill., and *E. asteris*, Stdg. From *E. illotella* it may be at once separated by its larger size and much longer palpi, otherwise it is not unlike it in general appearance. M. Ragonot would place it between *E. illotella* and *E. asteriscella*. With regard to *E. prodromella*, as M. Ragonot points out, the fore-wings in that species are narrower (the ratio of the breadth to the length is 15 to 50, whereas in the Portland species it is 15 to 46); the costa is more distinctly arched; there is a distinct discal spot, and the hind-wings are pure white. In addition to this, the angles formed by the line which begins near the middle of the costa are in *prodromella* very acute, being little more than 45° , and the light and dark parts of the wing are reversed in position. *Prodromella* has also a pearly gloss, whereas the Portland species is dull.

Mr. Barrett has kindly lent me specimens of *E. illotella* and *E. prodromella* for comparison. Of *E. asteriscella* I have not seen a specimen, but M. Ragonot says—"The principal difference I find between *asteriscella* and your insect is that the inner margin of *asteriscella* is ochreous, as in *illotella*; the thorax is pale reddish-ochreous-grey; the wings are slightly tinted with ochreous or pale brownish, whilst in your insect the fore-wings are more elongated, of a uniform cinereous-grey, clouded with dark grey; the veins streaked with blackish, as in *asteriscella*, the thorax concolorous. The second line does not appear to be indented on the discal fold, as in *asteriscella*. *Asteriscella* measures 22 to 23 mill., whilst the English specimen measures 26 mill."

Of *E. asteris* M. Ragonot says nothing, except that its food-plant is *Aster tripolium*, which does not, so far as I know, occur in the neighbourhood where my specimens were taken. I propose to name the new species *Bankesiella*, after my friend, Mr. Eustace R. Bankes, of Corfe Castle, who has done so much to add to our knowledge of the *Micro-Lepidoptera* of Portland and Purbeck, that I think he well deserves that his name should be recorded in that of one of them. In conclusion, I would express my best thanks to those who have so kindly and materially given me their help.

Montevideo, Weymouth:

July 16th, 1888.

Catephia alchymista, Schiff., at St. Leonard's.—My eldest son caught a fine specimen of this very rare moth at sugar, about 9.30 p.m. on the 24th of last month; it was captured on a wall towards the west end of St. Leonard's, on the high ground near Maize Hill. I do not know if there has been any record of its capture since 1858, in which year Dr. Wallace took a specimen in the Isle of Wight, in the month of September, as recorded in Ent. Ann. for 1859: an excellent figure of it is given on the frontispiece of the Annual for 1860.—EDWARD SAUNDERS, St. Ann's, Mount Hermon, Woking: July 11th, 1888.

Abundance of Ocneria dispar, L., near Algeçiras.—On June 28th last, I crossed over from Gibraltar to Algeçiras to explore some new ground between that town and the village of Los Barrios. The lower slopes of the hills, on the left-hand side of the road between these two places, are clothed with an open wood of large cork-oaks, which, from a distance, presented a singularly bare and wintry appearance. But I was not at all prepared for the remarkable entomological sight which met my eyes when I entered these woods: for two or three miles at least, scarcely a leaf on the cork trees had escaped the ravages of the larvæ of *Ocneria dispar*, L.: the pupæ, living and empty, filled every crevice in the bark, and the great sluggish white ♀ moths congregated in scores on the under-sides of the larger branches, which were covered with their down-clothed patches of eggs. Their more volatile partners meanwhile filled the air as thickly as the flakes in a snowstorm. Without exaggeration, it would have been no difficult matter to have filled a wheelbarrow with *Ocneria dispar* in any of its stages, except, perhaps, the larvæ, though there was no lack of late specimens of these. Hawthorn, apricot, and almond trees were served almost as badly as the cork-oaks; willows and poplars were eaten, but not to any great extent; and ash, alder, and wild olive were apparently untouched. None of the larvæ or pupæ appeared to be infested with ichneumons or other parasites, and the birds evidently did not care to eat them; the only creature at all likely to diminish their numbers was *Calosoma sycophanta*, L., but this handsome beetle was by no means common, as I found only one very large ♀ specimen in the wood.

Only twice before have I seen a spectacle of insect devastation at all approaching the present: in 1870, when the larvæ of *Liparis chrysorrhæa* left not a leaf on the thorn hedges throughout the Isle of Sheppey; and at Esquimalt, Vancouver Island, in the summer of 1882, when all the oaks were stripped by the larvæ of *Therina fervidaria*, Walk., and their trunks and branches were paved with the handsome Geometrid moths in September.

It is rather curious that I have never yet seen the larvæ of *Ocneria dispar* in the Cork Woods of San Roque, only some six miles distant from those of Los Barrios, and have met with only about half a dozen ♂ moths there; and the insect appears equally scarce on the Rock of Gibraltar. The moths are for the most part very clearly and brightly marked, but even smaller than the domesticated race so commonly bred in England.—JAMES J. WALKER, H.M.S. "Grappler," Gibraltar: July 2nd, 1888.

Note on the food-plant of Gelechia marmorea, Haw.—Last spring, when collecting on the sand hills in this neighbourhood, I found the larvæ of this species freely on *Silene conica*, some mining the leaves, some boring down the shoots, and others in sandy cases on the surface of the soil under the radical leaves.—W. H. B. FLETCHER, Worthing: April 30th, 1888.

The larva of Lobesia permixtana.—Mr. Stainton's paper on *Lobesia permixtana* (vol. xxiv, p. 58) being still fresh in our memories, it is as well, perhaps, not to delay relating my own recent experience in breeding the insect. Whilst I was beating the sloe bushes on the outskirts of a wood for larvæ of *Corycia punctata* at the end of July, 1887, there fell into the umbrella two small, dark, extremely active larvæ, quite unlike anything I had seen before. Hoping that I had found something good, I carried them home with much care. They behaved in confinement much after the usual fashion of leaf-eating Micros, and when they had reached full growth, they left the feeding chambers, and drawing two leaves flat together, spun between them oval, slender, and closely woven cocoons of pure white silk. A moth (♀) emerged May 20th. The other pupa died; in the search for the cocoons among the leaves it had been accidentally torn from its cocoon, and probably injured.

The larva is cylindrical, of moderate proportions, and tapering moderately towards either extremity. The segmental divisions deeply cut; viewed from above, the profile of the segments is flat, not curved as is usually the case. Head small, shining, pale brown; thoracic plate also pale brown and shining, and with a narrow grey edging behind. Anal plate not noticeable. Colour a dark puce, with the spots white and small, but conspicuous. Legs black. Very active, jumping about like a *Gelechia*. The pupa is uniformly pale yellow, and not remarkable in shape.

It may still be questioned how far this establishes the true food-plant of the insect. It would have been more satisfactory had more of the larvæ been obtained, for a good bit of the plant was beaten on two or three occasions, and the larvæ might have been expected to have fallen in some numbers, for the moth is not uncommon here. Heinemann, however (as quoted by Mr. Stainton) has noticed that the moth frequents sloe, and it must also be remembered that the plant is always to be found in the kind of locality (woods and their outskirts) where the insect occurs. But be this as it may, it is scarcely possible, I think, that Herr Brischke's larva mining the stem of *Solidago virgaurea*, from which he says he bred *permixtana*, can be identical with this leaf-feeder of the sloe; and I suspect that one of those mistakes has occurred here which happens at some time or other to all of us in dealing with these tiny creatures. Now there is in the *Solidago* here a larva corresponding very closely in appearance and habits with Herr Brischke's insect, and which is, I feel sure, the larva of *Catoptria aspidiscana*. I have not, however, reared it, for the occasion when I made the attempt some years ago was a failure, and has not since been repeated. In colour this larva varies from pale brown to white or yellowish-white, with a pink tinge in the last skin. Head black or chestnut. A black divided plate on the second, and a paler one on the anal segment. It begins by eating the flower buds at the top of the plant, uniting them firmly together, and thence works its way into the stem, which it mines for an inch or more. It makes up in the soil or among rubbish.—JOHN H. WOOD, Tarrington, Ledbury: June, 1888.

[In reply to an Editorial query whether the larvæ of *Lobesia permixtana* really did eat the sloe leaves, Dr. Wood adds:—"The larvæ of *permixtana* certainly ate the sloe, and did well upon it; they were not full grown when taken, and no other food was given them. They must also have eaten nothing else before capture, as they were beaten out of a little grove of sloe bushes with no other plant intermixed."—H. T. S.]

Neuronion clathrata in the London district.—With reference to the occurrence of this insect in the Tottenham Marshes (*cf.* Ent. Mo. Mag., xxiv, p. 173), it may be well to mention that I have seen another example, taken by Mr. Boden at the same place on June 2nd of this year. He has obligingly indicated to me the exact locality, but in consequence of the bad weather and other causes I have not been able to visit it.—R. McLACHLAN, Lewisham, London: July 11th, 1888.

Apanteles ferrugineus, Reink.—This little ichneumon was discovered by Mr. Porritt, who bred it from larvæ of *Chilo phragmitellus*; it has also been bred by Mr. W. H. B. Fletcher from larvæ of *Macrogaster arundinis* from Wicken Fen; from this it would appear to confine its attacks to larvæ feeding in the stems of *Arundo phragmites*. I should be much obliged if Entomologists would kindly let me see the ichneumons they may breed from this source; I think it very probable that *Apanteles ferrugineus* is not so scarce as it seems to be, but that its habits have screened it from observation.—JOHN B. BRIDGMAN, 40, St. Giles', Norwich: June 23rd, 1888.

Some insects common to Europe and Colorado.—Packard, in the Ann. Rept. U. S. Geol. and Geog. Survey for 1873, has a very interesting paper on the moths of Colorado, in which he records several species which are common to Europe, and mostly, at any rate, belong to the boreal fauna. It may be of some interest in this connection to give a list of such species of insects common to Europe, as I have myself met with during the past year in Colorado, although it cannot be considered in any sense complete, many of my finds not yet having been examined by those competent to determine the species:—

Philonthus æneus, Rossi.—Straight Creek, near Dillon, Summit Co., alt. about 8850 feet: frequent. *Aphodius granarius*, Linn.—Near Swift Creek, Custer Co., alt. about 8300 feet: common. *Chrysis cyanea*.—Mr. T. R. Billups so named a Custer Co. *Chrysis*, but to me it seemed a different species. *Pieris napi*.—Represented in Custer Co. by the form *oleracea*, Bdv., and seasonally dimorphic. *Danaïs Plexippus*, Linn.—Custer Co.: abundant. *Vanessa Antiopa*, L.—Custer, Summit, Eagle, Garfield, Mesa and Delta Counties: abundant. *V. cardui*, L., and *V. Atalanta*, L.—Swift Creek, Custer Co.: the first abundant. *Cidaria (Petrophora) populata*, Linn.—Custer Co., 1887. *Nomophila noctuella*, Schiff.—Saguache Co., 1887, and Packard records it from Park Co. *Lucilia Cæsar*, L., *Musca domestica*, L., and *Cimex lectularius*, L.—Custer Co., &c., about houses.—T. D. A. COCKERELL, West Cliff, Custer Co., Colorado: June 16th, 1888.

British Diptera.—This being the height of the collecting season, I should like to call the attention of Entomologists to the *Diptera* of this country. This order, neglected for so long, is now being thoroughly revised, so far as the British species are concerned, and a vast amount of assistance can be rendered by Entomologists in general by the capture of these insects during excursions.

Diptera should be pinned with Carlsbad (long, thin) pins, and placed high up the pin; they need not be set, but dates and localities should invariably be appended.

It may be remarked, for the benefit of the ambitious, that there is a good chance of distinction in this direction, as species new to the British fauna are continually being added.

Many families, thanks to the indefatigable efforts of Mr. Verrall and Dr. Meade, have undergone complete revision, but there is still much to be done; only one who has actually compared them can believe the discrepancies in the lists of British species as given by Curtis, Stephens, and Walker, and as compared with the revised catalogues.

If any one will take an interest in working up the fauna of his district, I shall be most happy to render any help that lies in my power, and will willingly name any specimens that may be submitted for that purpose.—E. BRUNETTI, 129, Grosvenor Park, Camberwell: *July*, 1888.

[We prefer the English "long" pins, such as Tayler & Co.'s Nos. 2 and 16, to any continental pins. They are not quite so "long" (an advantage) and they are stronger (an additional advantage). Any insect too small to take a "No. 2," should be pinned with an ordinary fine short pin, and then be mounted on pith (that of Jerusalem Artichoke is the best), which can be impaled with a suitable long pin. The very fine long continental pins are objectionable for several reasons.—EDS.]

Newspaper Entomology.—I have just cut this paragraph from a local paper:—

"THE CATERPILLAR PEST.—The *Kentish Observer* has received an interesting explanation of the caterpillar visitation which is proving so destructive to the fruit and nut crops in Kent. It states that a farmer who has been making an investigation into the subject has come to the conclusion that the spawn which produced the caterpillars was deposited by the swarms of butterflies which swept our coasts last autumn, and which were supposed to have been driven over from the continental forests by the storms."

I think comment would be superfluous!—J. H. A. JENNER, 4, East Street, Lewes: *July 14th*, 1888.

Reviews.

REVISIO SYNONYMICA HETEROPTERORUM PALÆARCTICORUM QUÆ DESCRIBERUNT AUCTORES VETUSTIORES (Linnæus, 1758—Latreille, 1806): Von O. M. REUTER. Helsingfors: Druckerei der Finnischen Litteratur-Gesellschaft. 1888. 4to, pp. 1—458.

This work contains two parts—i and ii—though the paging is continuous. The first contains (in German) an introduction to the subject; a historical review; 1st, of works prior to the use of binary nomenclature; 2nd, of works with binary nomenclature (1758—1806); 3rd, of later works in which those of former authors are either referred to or made use of, pp. 1—73: all in chronological order.

The object of the work is set forth thus:—"Stability in nomenclature has for a long time been one of the most earnest desires of Entomologists, as without it all works on system, biology and geographical distribution of insects are very difficult. I have, therefore, herein attempted to give a contribution towards a firm position for the nomenclature of the palæarctic *Hemiptera-Heteroptera*, and hope this work will not be unwelcome, although I know in advance that it will not find unqualified assent."

The confusion in specific names which has existed in the *Hemiptera* arises, like that in other Orders, either from the insufficiency of the first description to identify a species when several more or less similar species have been subsequently discovered,

or from the errors of contemporary or succeeding authors in the application of the old names, not always due to ambiguity in the original descriptions, as is proved by recent investigations; or, it may be, that a species has been described and named in ignorance of a previous description and name.

The author states that the rules of nomenclature that have been adopted are practically those set forth by Staudinger in his "Catalog der Lepidopteren des Europäischen Faunengebietes." To most of the sixteen rules are added examples of the application of them to the *Hemiptera*; the claims of the "Law of prescription" and of "Continuity of use for a certain period" are criticised adversely; and the rule of Priority of printed publication of recognisable description is insisted on the only means of ensuring stability in nomenclature.

Although endeavours have been previously made the nomenclature of the palæarctic *Hemiptera-Heteroptera* described by the old authors has never till now been overhauled on fixed principles, and it is fervently to be hoped that this revision will, in the main, be accepted, and that we may be reconciled to the inconvenience of the changes of name, in some cases necessary, by the consideration that they are final. The labour of the investigation of the 359 species enumerated, verifying the descriptions, where possible, by actual examination of the original examples, and tracing, at times, one species under several names, has been enormous, and the result of this work by an impartial and able Hemipterist is not, we think, likely to receive an adverse criticism to any appreciable extent. The work is a very important contribution towards the attainment of fixity of specific nomenclature and merits study by all Entomologists to whichever Order of insects they may be attached. For, as the author says, if the principles and amendments of this work be accepted, all exotic *Hemiptera* or *Homoptera*, as well as insects of some other Orders, require a similar revision; this having been already made in respect of *Coleoptera*, *Lepidoptera* and some groups of other Orders.

Nine pages are devoted to the consideration of the principles on which the partition and appropriation of genera should be effected; on this portion of the work it is possible that opinions may differ, but genera are not of so much consequence as species, for, after all, the constitution of a genus is a matter on which authors do not agree, as is shown in the works of every writer up to this time.

Part ii consists of the synonymy of 359 species worked out in chronological order on the principles adopted; lists of the genera and species adopted in place of those used in Dr. Puton's "Catalogue d. Hémip. d'Europ.," 2nd edit.; an Index generum and an Index specierum.

HÄNDBUCH FÜR INSEKTEN-SAMMLER VON ALEXANDER BAU. Band ii; DIE KÄFER (Magdeburg, Creutz'sche Verlagsbuchhandlung, 1888).—This is a sort of popular guide to the study of the beetles that are more usually met with in Germany, Austro-Hungary, and Switzerland; and to those younger collectors of *Coleoptera* in England who understand German, it may certainly prove of considerable service, as the plan is well worked out, and the tables and descriptions seem concise and useful; it is written chiefly for beginners, and in the more obscure groups only a few species are mentioned, but the generic tables will be found useful by all. One of the great features of the book is the intercalation in the letter press of small woodcuts representing species of typical genera, which, in many cases, are well executed.

THE NATURAL HISTORY OF HASTINGS AND ST. LEONARDS AND THE VICINITY.
Second Supplement. St. Leonards-on-Sea. 1888.

The Rev. E. N. Bloomfield and his fellow workers are doing their best to make their local list one of the most complete that exists. This second supplement bears evidence that whole critical groups of genera have been submitted to specialists. Amongst the INSECTA over 350 additional species are recorded, the *Hymenoptera*, *Coleoptera* and *Diptera* figuring conspicuously. But there no doubt remains much yet to be done. The British *Orthoptera*, taken as a whole, are very poor as to species, yet we venture to suggest that the Hastings district, if thoroughly worked, possesses more than thirteen of them, the number quoted in the "complete list."

CATÁLOGO DE LOS COLEÓPTEROS DE CHILE, por FEDERICO PHILIPPI (from the Annals of the University of Chile, tom. lxxi, 1887).

The author of the new Catalogue of the *Coleoptera* of Chile has rendered good service to all Entomologists who take any interest in the fauna of this country. A very large number of genera and species are absolutely peculiar to the region, and the Chilian Coleopterous fauna is in consequence of the highest importance in matters of geographical distribution. Probably no similar extent of country in the world possesses so many peculiar endemic forms. The Catalogue extends to 190 pages, and, in addition to a good deal of synonymy, gives the localities of many of the species. The only important work that has yet appeared on the Chilian fauna is the well-known "Historia física i política de Chile," by Claudio Gay, vols. iv and v (1849 and 1851), of the Zoology of which are in great part devoted to the *Coleoptera*.

The present Catalogue about doubles the number of genera included by Gay, 686 against 345, and adds very largely to the number of species, 2247 against 891. The total of 2247 must of course represent only a small proportion of the number of species really existing there; the more obscure and smaller forms having been very little worked at as yet. Fifteen families not included by Gay are added.

The author gives the following analysis:—The genera most numerous in species are *Praocis* (65), *Listroderes* (31), *Antarctia* (30), *Maypa* (30), *Mordella* (29), *Feronia* (28), *Telephorus* (28), *Deromecus* (27), *Trechus* (25), *Dasytes* (22), *Bruchus* (21), *Ceroglossus* (20), and *Gyriosomus* (20). The families the most numerous are:—*Tenebrionidæ*, 63 genera, 263 species; *Carabidæ*, 52 genera, 251 species; *Curculionidæ*, 55 genera, 248 species; *Staphylinidæ*, 58 genera, 170 species; *Scarabæidæ*, 49 genera, 154 species; *Cerambycidæ*, 57 genera, 153 species; *Chrysomelidæ*, 53 genera, 107 species; *Malacodermidæ*, 20 genera, 106 species; *Elateridæ*, 34 genera, 89 species; *Buprestidæ*, 20 genera, 83 species; *Cleridæ*, 12 genera, 73 species; *Coccinellidæ*, 13 genera, 40 species; and *Pselaphidæ*, 10 genera, 35 species. The following families contain but a single species:—*Heteroceridæ*, *Lymexylonidæ*, *Cupesidæ*, *Endomychidæ*, and *Erotylidæ*.

It is worthy of note that nearly one-fifth (413) of the total number of species belong to the *Heteromera*. The author does not include the Galapago Islands, but in one or two cases mentions Juan Fernandez.

Since the publication of Gay's work, numerous authors have paid particular attention to the Chilian *Coleoptera*, more especially MM. Fauvel, Fairmaire, and Reitter, Drs. R. Phillipi and D. Sharp, and Mr. Reed.

Let us hope that the publication of this Catalogue will induce others to pay more attention to the very interesting and highly specialized Coleopterous fauna of Chile. To judge from Mr. Bartlett-Calvert's Catalogue of the *Lepidoptera* published in 1886, the *Coleoptera* have received much greater attention as yet, the total number of *Lepidoptera* being only about one-fifth (455) of that of the *Coleoptera*.—G. C. CHAMPION.

THE BUTTERFLIES OF NORTH AMERICA: by W. H. EDWARDS. Third series, Pt. v, with three plates. Boston: Houghton, Mifflin and Co.; London: Trübner and Co. 1888.

This Part is devoted to a consideration of *Melitæa rubicunda*, H. Edw., a species from Western N. America, not unlike the *Artemis* of Europe; habits at present unknown; two species of blackish *Erebia*, viz.: *Magdalena*, Streck., and *Heydenii*, Edw., also Western, and the former ascending to 14,000 feet. In connection with some butterflies of high altitudes there are some interesting remarks by Mr. Bruce, who captured it. The third plate is devoted solely to *Debis portlandia*, F., with about 25 figures—a complete life-history—and no less than eight 4to pages occupied by its elucidation.

We need only repeat here the unqualified praise bestowed upon previous parts of Mr. Edwards' work.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: June 28th, 1888.—JOHN T. CARRINGTON, Esq., F.L.S., Vice-President, in the Chair.

Miss M. Kimber and Mr. A. E. Hall were elected Members.

Mr. Hawes exhibited pupæ of *Argynnis Paphia*, L., and *A. Adippe*, L. Mr. Slater, a specimen of *Chærocampa nerii*, L., from Zululand. Mr. Tugwell raised a question as to whether the specimen was *C. nerii*. Mr. South agreed, and suggested that it was probably a species very closely allied to *C. nerii*. Mr. West, of Streatham, specimens of *Chariclea umbra*, Hufn., bred from larvæ found at Folkestone. Mr. Tugwell, examples of *Spilosoma menthrasti*, Esp., and var. *ochracea*, White, bred from ova received from Dundee, the larvæ having been fed upon Stinging Nettle. Mr. Tugwell mentioned that he had recently bred several specimens of *Sesia sphegiformis*, Fb., the larvæ having been found at Tilgate Forest, and remarked that in his experience he was of opinion that the insect was three years in the larval stage, the ova being laid in July, the larvæ feeding through that year, the second year they were to be found feeding close to the bark, and fed during the third year, pupating about the second week in May, the perfect insect appearing the first or second week in June.

July 12th, 1888.—JOHN T. CARRINGTON, Esq., F.L.S., Vice-President, in the Chair.

Messrs. A. L. Clarke, W. B. Farr, and R. Atherton were elected Members.

Mr. Weir exhibited a male specimen of *Lycæna Icarus*, Rott., which he had taken at Lewes in June last. It was remarkable as showing a slight tendency to hermaphroditism, there were on the upper-side of the under-wings two well-defined and several smaller sub-marginal spots, the colour of all the wings in other respects was that of an ordinary male of the species. His attention had been drawn to the insect by the actions of another male of the same species. Some discussion followed.

Mr. Jäger, two specimens of *Arctia villica*, L., with dark hind-wings, forms of *Eupithecia rectangulata*, L., and the larva of *Callimorpha Hera*, L. Mr. R. Adkin, *Eupithecia togata*, Hb., bred from Perthshire larvæ, which varied much as to colour. Mr. Dobson, *Asphalia videns*, Fb., and *Notodonta chaonia*, Hb., bred from larvæ beaten in the New Forest. Mr. Turner, a variety of *Vanessa cardui*, L. Mr. West, of Greenwich, examples of *Colymbetes notatus*, Berg., *Cercyon aquaticus*, Mull., *Heterocerus obsoletus*, Curt., taken on the Salt Marshes, Milton, near Gravesend. The Secretary exhibited, on behalf of Mr. T. D. A. Cockerell, a sketch of a *Thomisid* spider on flower of *Ligusticum montanum*, Benth and Hook, observed by him in Custer County, Colorado, and read notes on the deceptive likeness of the spider to the flower. Mr. Weir said it was not at all unusual; in England there were several species of spiders closely resembling the flowers on which they were in the habit of sitting for the purpose of obtaining their food.—H. W. BARKER, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON: *July 4th*, 1888.—Dr. D. SHARP, F.L.S., President, in the Chair.

The Hon. Lionel Walter de Rothschild, of Tring Park, Tring, Hertfordshire, was elected a Fellow of the Society.

Mr. Enock exhibited male and female specimens of a spider received from Colonel Le Grice, R.A., who had captured them at Folkestone on the 27th May last. They had been submitted to the Rev. O. Pickard-Cambridge, F.R.S., who identified them as *Pellenes tripunctatus*, a species new to Britain. Mr. Enock also exhibited specimens of *Merisus destructor* (Riley), an American parasite of the Hessian Fly, bred from British specimens of that insect.

Mr. Wallis Kew exhibited a number of larvæ of *Adimonia tanaceti*, Fab., found in Lincolnshire, feeding on *Scabious*.

Mr. Porritt exhibited a number of variable specimens of *Arctia mendica*, bred from a batch of eggs found last year on a species of *Rumex*, at Huddersfield. Mr. Porritt said that this species, in the neighbourhood of Huddersfield, was often more spotted than the typical form, but he had never before seen anything approaching in extent the variation exhibited in these bred specimens. Out of forty-four specimens (twenty-five males and nineteen females) not more than eight were like the ordinary type of the species.

Mr. McLachlan exhibited a quantity of *Palingenia longicauda* (in alcohol) from Holland—the largest of the European *Ephemeridæ* (Mayflies), and at the same time one of the most local.

Mr. Jacoby exhibited the following species of Phytophagous *Coleoptera* from Africa and Madagascar, recently described by him in the "Transactions" of the Society, viz.:—*Lema laticollis*, *Cladocera nigripennis*, *Ædionychis madagascariensis*, *Blepharida intermedia*, *B. nigromaculata*, *Chrysomela madagascariensis*, *Sagra opaca*, *Blepharida ornaticollis*, *B. laterimaculata*, *Mesodonta submetallica*, *Schematizella viridis*, *Spilocephalus viridipennis*, *Apophyllia smaragdipennis*, *Æthonea variabilis*.

Mons. Alfred Wailly exhibited a large number of species of *Lepidoptera* and *Coleoptera*, recently received by him from Assam, from the West Coast of Africa, and from South Africa. He also exhibited eggs and living larvæ of *Bombyx Cytheræa*, and made remarks on the life-history of the species.—H. Goss, *Hon. Sec.*

NOTES ON *PRAYS CURTISELLUS* AND *RUSTICA*.

BY T. A. CHAPMAN, M.D.

It is now a good many years since Mr. Stainton decided, on what he considered hardly sufficient evidence, that these two forms were one species, and the matter has not since been conclusively worked out. It so happens that during the past twelve months the opportunity has fallen in my way of making an extensive acquaintance with both forms, and especially with *rustica*. I have no doubt both forms are, as Mr. Stainton determined, but one species, and though this is a less interesting result than the contrary would have been, my observations may be worth recording, as they disclose a hitherto unnoticed chapter in the history of the species.

Towards the end of June, 1887, I examined certain galls on some ash trees, which I had often noticed in past years, without paying them any attention. On two trees to which I had easy access these galls were numerous, and I afterwards found not a few others in the neighbourhood. The gall is a curious woody development of the stalks of the inflorescence, which becomes aborted, with a rough almost woolly surface, and of very irregular knotted shape; in size from about that of a pea to masses nearly as large as a fist, but usually about the size of a small walnut. During the past few years these galls have been very large and numerous on infected trees, and as they persist for several years as dead woody masses, are often very conspicuous. This year I find they are not growing so well, and the fruit is partially or wholly developed on them. It appears that these galls are caused by a microscopic mite of glassy transparency, discovered, as Mr. McLachlan informs me, by Dr. Löw, and described by him in a paper, "Ueber Milbengallen des Wiener-gegend," in the 24th Vol. (1874) of the *Verh. zool.-bot. Ges. Wien*, pp. 499—500.

As I was not at the time aware that this fact had been demonstrated, I was inclined (though of course in error) to attribute them to one or other of two larvæ that I found in them. One of these is a small gall-midge (*Diplosis* sp.) with a rather active little yellow larva, which is double brooded; the larva passing the winter in its cocoon. Mr. Meade tells me that the cocoons of these larvæ are supposed to be an exudation from the surface of the larva, but this is certainly not the case with this species, as I have seen it actually spinning its cocoon, which is of veritable silk. The cocoon is made in any crevice of the gall, both by the summer and winter broods.

The other larva was Lepidopterous, and, after sundry guesses, was surmised to be that of *Curtisellus*, which in the event proved to be correct.

I collected a pint or two of galls ; were ash trees as accessible as blackberries, I know trees that would have afforded bushels, and in 1887 I was unable to find any gall that was free from larvæ ; the number of larvæ in an infested tree must, therefore, have been very great, since I bred, chiefly during August, some 200 moths, every one of which was of the black form (*rustica*), only four or five presenting a slight shading that possibly represented the dark costal triangle of *Curtisellus*.

This seemed very strongly to suggest that *rustica* was a distinct species, though it also appeared possible that *rustica* was the summer brood of *Curtisellus*. I therefore followed *rustica* on through the autumn, winter and spring, and kept a look out for *Curtisellus*, which I did not succeed in finding till the spring, though then I succeeded in meeting with it freely, still in its winter quarters. For brevity I call the gall-feeder *rustica*, the ordinary form *Curtisellus* ; also using the names more correctly, *rustica* for the dark, *Curtisellus* for the typical form.

The summer *rustica* lays her eggs in the galls from which she herself was bred ; the young larvæ live therein as their parents did, until the approach of winter and the failure of the sap in the dying galls forces their retreat. At this time some are still very small, others are not far from half-grown ; in each case they burrow into the bark or into a bud, a very common spot is at the base of the stalk supporting the gall. Here, either in a burrow in the bark or in a bud, they pass the winter, really hibernating, that is, having taken up their winter quarters they do no more feeding till spring. I was unable by forcing to make any of these continue to grow or make any progress in the autumn ; but they, nevertheless, do hibernate at various ages.

In April many may still be found smaller than others at date of going into winter quarters. In the spring they become active when the flower-buds of the ash begin to swell, and feed up, some few in the bark, but the majority make their way to a bud, the interior of which they devour, making their slight and flimsy cocoon among the *débris*. This spring the ash was nearly a month late, and the moths probably so also ; they were on the wing on June 11th.

July 28th, 1888.—Mr. Wood informs me that *Curtisellus* and dark vars. are abundant on palings at Stoke. At this date I find a full-grown *rustica* larva.

However, I bred *Curtisellus* this spring at practically the same dates (beginning of June) as *rustica*, and in so abnormal a season as

this dates go for very little ; but I have little doubt Mr. Wood's specimens are early (for this season, not for an ordinary one) specimens of the summer brood.

On August 3rd I find larvæ of *Curtisellus* on the ash saplings that afforded hibernated larvæ in May ; these are full-fed, or nearly so, and are living in the bud for next year and the pith beneath it, and in some instances between united leaves. Judging from the rapidity of development of *rustica* last year, a very few days hot weather would make them appear as moths. These larvæ are associated with small blotch mines in the ash leaves, but two that were found still tenanted contained Dipterous larvæ.

Curtisellus passes the winter almost invariably in the bark, exceptionally in the bud, but it equally goes to the buds in spring. But I find it usually on suckers and the young ash grown for hop-poles, and the buds open so rapidly that its usual habit is to find the buds open so quickly that it has to bore into a young shoot, and then bore downwards in the pith. On a *rustica* tree I found a larva doing so, and settled that I had found a *Curtisellus* among them ; he was large, fat and pale, but he only produced *rustica*, but one of the largest I have met with.

A close comparison of many specimens of the larvæ of *Curtisellus* and *rustica* led to no point of distinction being seized ; in some instances the larvæ were identical. The range of variation in colouring is considerable : a dark larva has a broad chocolate band down the back, marbled with greenish-yellow markings ; in others the sides only of this band are chocolate, the centre being green ; and in a few the whole back is green. The chocolate is sometimes so pale as to be pale reddish-brown.

Curtisellus is usually a larger, fatter and paler larva than *rustica*, which is usually dark and smaller. The pupa also varies from a pale green pupa to one with a rich dark back, almost like that of the larvæ ; but whilst the mass of *rustica* are darker than the mass of *Curtisellus*, all varieties occur in either form.

The summer brood of *rustica* is decidedly and uniformly smaller than *Curtisellus*, and its brown is so deep that black is perhaps a more correct term. Spring *rustica* presents many examples of full size, and it is possible that some of the smaller specimens are due to their being bred, though small specimens are common enough among those seen at large, not, however, a great number altogether.

On rearing the spring brood of *rustica* the larger proportion produced *rustica*, but about one in six were of the *Curtisellus* form. In

the case of *Curtisellus* the majority were *Curtisellus*, but about one in six were *rustica*. In both instances *rustica* was the earliest to appear; all the first specimens of both being *rustica*, all the last specimens of both *Curtisellus*.

Curtisellus, then, presents two distinct races—one living entirely on bark, bud and leaves, usually of saplings; a spring brood appears the end of May (this year middle of June) which presents about one in six of a dark brown or black form, usually with traces of the ordinary marking. This has a summer brood, appearing in July and August, the proportions of black specimens in which I cannot report.

The other race (*rustica*) lives in the gall produced by mites on ash trees; the spring brood presents five dark specimens to one light, but otherwise resembles the spring brood of the ordinary form; its summer brood is invariably black, and distinctly smaller than the type. The hibernated larvæ of the spring brood live on bark and buds, similarly to the type, but less frequently attack the leaves, preferring the opening flowers, if too late to feed up in a bud.

I failed entirely last autumn to find the mining larvæ of *Curtisellus*. I found *rustica* occasionally among the leaves, when failure of the galls has forced him to shift for himself, and met with some very small ones. These ate the lower surface from below, generally close against a rib, and covered themselves by a web passing from the rib to the leaf, the resulting gallery being not unlike a mine. When a little larger, it would fasten two leaves together flatly and live between them.

I may note that on several trees not only twigs but great branches have died from the attacks of *rustica*. They may have been weakened by the larger call on the sap in growing the galls, but the real mischief is done by the hibernating larvæ injuring the bark of the twigs, and especially devouring all the buds in spring.

A minute *Chalcis* attacks the *Diplosis*, and two ichneumons affect the *Prays*. Sundry omnivorous *Tortrix* larvæ are found in the galls, on which *Eupithecia fraxinata* feeds also. In the spring very juvenile larvæ of *C. xerampelina* occur in the buds, and closely resemble those of *rustica*, both in size and markings at that date. I also met with in a twig of ash this spring a specimen (hibernating) of *Hylesinus oleiperda*, which I never before succeeded in finding in this district, though some twenty years ago I made rather active search for it.

Firbank, Hereford:

August, 1888.

DESCRIPTION OF THE ASH-CAULIFLOWER GNAT.

BY R. H. MEADE.

DIPLOSIS FRAXINELLA, *sp. n.**Cecidomyia minuta*?, Winnertz.

Flava, thorace nigro-striato; abdomine basi-nigro; halteribus albis, amplisque; alis, venis cubitalibus prope apicibus exeuntibus. Long. ♂ et ♀ $\frac{2}{3}$ mm.

Head black; palpi and proboscis pale yellow; face with a tuft of white hairs; antennæ in male about one and a half times the length of the insect, consisting of 2 basal joints which are yellow and sessile, and of 24 moniliform pedicelled ones, of a pale brown colour, verticellated with white hairs; the stalks are about as long as the joints: in the female the antennæ are nearly as long as the body without the oviduct, and consist of 2 basal joints as in the male, and of 12 ovoid very shortly pedicelled others, to which a minute, tapering, terminal one is added.

Thorax brownish-yellow, marked with three longitudinal brownish-black stripes, which are almost confluent in the male, so that the dorsum looks nearly black; in the female the middle stripe is broad, while the lateral ones are very narrow.

Abdomen yellow, clothed with white hairs, and having the base blackened; the black part is more distinct in the female than in the male, especially upon the upper-surface; forceps of male large and yellow; oviduct of female wanting.*

Halteres large and white.

Wings clothed with dark hairs; second longitudinal or cubital vein almost straight until it nears the extremity, when it curves rather suddenly down; and reaches the border apparently slightly before the apex; anal vein very indistinct.

Legs with trochanters very pale, the other joints are clothed upon their upper-sides with black hairs, which are most numerous upon the tarsi, which look darker than the rest of the legs; the under-surfaces are furnished with white hairs, so that the legs look white beneath.

This very minute Cecid is probably the same as the one described by Winnertz under the name of *C. minuta*. It is rather an anomalous species, for though the antennæ are fully characteristic of the genus *Diplosis*, Lw., the direction of the cubital vein more resembles that of *Cecidomyia*, the point terminating apparently a little before the apex of the wing. Winnertz only knew the male of his *C. minuta*, and was ignorant of its life-history; it also differed according to his description from the male of the ash-gall *Diplosis*, by having the antennæ twice as long as the body, and the points of the forceps black; I have, therefore, thought it better to describe it as a new species, giving it a characteristic name.

Like some other species of *Diplosis* this one lives as an *inquiline* in the cauliflower ash-gall, where it was found by Dr. Chapman, in August, 1887, along with the larvæ of *Prays rustica*, and was kindly sent by him to me for identification.

Bradford, Yorks: August, 1888.

* The only two specimens which I received were dried, in which state the male organs cannot be fully described.

ADDITION TO THE LIST OF BRITISH *HEMIPTERA*.

BY EDWARD SAUNDERS, F.L.S.

AMBLYTYLUS DELICATUS,

Perris, Nouv. Exc. dans les Grandes Landes, Extr. Ann. Soc. Linn., Lyon (1857), p. 87; Reuter, Hem. Gym. Eur., ii, p. 210.

♂ narrow, almost like an *Orthotylus* in form. ♀ more resembling *affinis*. Pale yellowish-green, clothed with very fine whitish hairs, with occasional longer brown bristles on pronotum and hemelytra. Head green, about as long as wide. Antennæ finely pubescent; basal joint with a few dark bristles, 2nd joint slightly longer than the 3rd, and in the ♂ considerably thicker. Rostrum extending to about the middle of the abdomen in the ♀, or beyond the middle in the ♂. Pronotum about twice as broad at the base as long, green in front, paler ochreous behind, anterior margin about three-quarters as long as the base, sides nearly straight, marginate anteriorly. Hemelytra extending much ♂, slightly ♀, beyond the apex of abdomen, pale ochreous, inclining to green on the clavus; cuneus and apex of corium of a browner colour, and clothed with brown semi-erect hairs; in the ♀ the disc of the corium has numerous brown-black hairs intermixed with the shorter pale ones, but in the ♂ these are very scattered and scarcely noticeable. Membrane lacteo-hyaline, nerves pale, its inner margin dark at the base, where it unites with the corium; cells brown at their apices, and below them a brown spot extends from the apex of the cuneus to the apex of the larger cell, leaving the triangular space between the apex of the cuneus and the smaller cell pale and clear. Abdomen green above and beneath; legs pale; femora with a few very indistinct spots near the apex; tibiæ with pale brownish spines. Length, 4½—5 mm.

Hab. on *Gnaphalium germanicum*, Woking; rare.

May be at once known from any of our British species by its colour and the peculiar marking of the membrane.

I have only succeeded in taking a few of each sex of this insect after many hours' search. The locality is close to my house, and *Gnaphalium germanicum* is abundant everywhere, but only on one spot, about 20 yards square, have I been able to meet with *Amblytylus*. The plant is more abundant and in much denser masses on the opposite side of the road to that on which the insect occurs, but it appears to be tenantless, so far as the *Amblytylus* is concerned. It is rather curious that *Orthotylus adenocarpus*, Perris, = *Douglasi*, E. S., and *Amblytylus delicatus*, Perris, both occurring in "Les Landes," should both have been introduced from Woking. I have little doubt that I am right in referring my insects to Perris' species, as I have a specimen of *delicatus* from him which, although old and faded, appears to agree with mine in all essential points, and, moreover, Dr. Reuter's description, cited above, agrees well with it, although he only appears to know the ♂.

St. Ann's, Woking: August 15th, 1888.

CLIMATIC AND LOCAL VARIATION IN OUR BUTTERFLIES.

BY C. G. BARRETT, F.E.S.

In vol. xxiii, p. 244, of this Magazine, are some suggestions by Mr. W. F. de V. Kane on climatic variation in butterflies, and on the local work of observation on such subjects suitable to be performed in connection with local museums, which suggestions have not as yet elicited any particular response.

As concerns local museums, this is not surprising, these institutions being in many cases entirely supported by the voluntary contributions of those who appreciate their usefulness: and where they are assisted by the local authorities, it is usually with an economy which bears a striking resemblance to parsimony, and a careful avoidance of the burning question of *rates*. Even in places of more advanced public spirit, such as Norwich, Nottingham, Sheffield, where the museums are supported with some degree of liberality, the time of the Curators is so completely occupied in cleansing, arranging, and keeping in order their numerous collections, that they can do little or nothing in the way of out-door collecting or observation, and certainly they are not supplied with means for employing collectors. Local museums are, in fact, almost entirely dependent for their specimens upon the liberality of friends, and for scientific *accuracy* of nomenclature and arrangement upon the voluntary assistance of specialists and local students.

Under these circumstances, there is little room for hope that much information upon local phases of variation will be attainable through the museums, and until municipal authorities arrive at a very different appreciation of scientific work from what they exhibit at present, it will be necessary to depend upon the hard-working local entomologists. Perhaps, even these are not always aware of the interest that may attach to the species which they see plentifully around them, and observations of this nature are more likely to be made by those who do not remain too long stationary, but from collecting in various and distant localities find their attention drawn to local variation. For this reason I propose—at the risk of repeating facts already noted—to give some of the results of my own personal observation.

Papilio Machaon, L.—It is possible, and, indeed, probable, that before the draining of the extensive fens of Bedfordshire, Cambridgeshire, Hants, and Lincolnshire, in the last and beginning of the

present century, this handsome species was much more widely distributed in this country than at present, but there seems to be little doubt that the few specimens observed on the south coast about twenty years ago were either casual immigrants or liberated specimens, and that for a long period it has in this country been practically confined to Wicken Fen in Cambridgeshire, and the fens of the Yare and Bure, and their tributaries in Norfolk. The specimens from these localities present no noticeable variation from the type as found on the continent of Europe, and in many other parts of the world.

Pieris rapæ, L.—Twenty years ago specimens occurred in Surrey in two summers, in which the ground colour was richer and yellower, or more ochreous than usual. These two summers were exceptionally hot. Last summer, during its (also) unusual heat, similar specimens were found here at Lynn.

Pieris napi, L.—I can fully endorse Mr. Kane's suggestion, that "this species deserves careful and systematic attention." Its variations are of especial interest. Thirty years ago I took in Shropshire a specimen of the variety *sabellicæ*, of Stephens—having the nervures broadly blackish on the upper-side; the specimen was damaged, and I, therefore, looked anxiously for more for many years: nothing of the sort came in my way while in the south of England. In the wet and stormy district of Pembrokeshire, however, females of the first brood occurred almost every year, in which the nervures of the upper-side were broadly grey, and at least one-half of the surface was also suffused with dark grey; no approach to the brownish-grey colour of continental *bryonicæ* was, however, seen. In August, 1885, I was at Belfast, and noticed this butterfly very commonly in the meadows, and of forms meriting special attention—which they received: they were rather over the average size, the males beautifully creamy, but with the apices of the fore-wings very black, and having large, round, black, discal spots, which were sometimes repeated on the under-side. The females had dark grey nervures, large strongly marked black spots, and broadly black apices—altogether handsome, striking insects. But when, hoping to get something still more remarkable, I wrote to a friend at Belfast, in the following May, to procure me specimens of the *first* brood, all those obtained and sent were ordinary looking specimens, such as I could take in my garden here, except that the apices were a little darker. I do not think that this spring generation was satisfactorily worked out, but as far as the evidence goes, the two broods presented the exact opposite to the usual rule in this species.

My best aberration, a most extraordinary specimen—a female, with the upper-side entirely of a canary-yellow, was taken in a fen in Norfolk.

Anthocharis cardamines, L.—When living at Haslemere, in Surrey, I used every year to meet with perfect dwarf specimens—about one-half the normal size—in both sexes, and the males of this variety were invariably the earliest specimens seen, the normal males appearing two or three days later. Similar specimens occurred casually in Pembrokeshire, but were not noticed to be earlier than the rest. In a marshy valley near Pembroke, in one season, I found several males of ordinary size, in which the black apical crescent was more or less suffused inwards, and in one specimen so much so that the suffusion affected one-third of the orange blotch, being blackest on the nervures. This form was searched for in succeeding years without success.

Gonepteryx rhamni, L.—Only one aberration observed—a female—in which all the central portion of the fore-wings is tinged with the yellow of the male. This colouring was much more noticeable when it was alive than it is now. The specimen was taken in Surrey.

Colias Edusa, L.—We can hardly claim to have any *local* variations of this species. In ordinary seasons, when it is not a generally common insect, none but typical specimens (with the exception of a rare example of the fixed variety *Helice*) are taken, but when, as in 1876-7, it becomes suddenly plentiful, all sorts of vagaries present themselves. In ground-colour, ranging from lemon to deep orange, with a pink flush, in the breadth and inward suffusion of the black marginal band, in the size and shape of the discal black spot, which is sometimes also pupilled, and in the number and size of the yellowish blotches in the marginal band of the female, which in some specimens disappear altogether.

Argynnis Aglaia, L.—In the west of Pembrokeshire, where this species is very abundant, many of the females show a tendency to suffusion of the upper-side with steel-black scales. Occasionally, this is very marked.

Argynnis Selene, F.—Common in Pembrokeshire, in all marshy places, where it is of normal colouring; but when it is found on the slopes of sea cliffs, darker females occur, which have large, rich brown blotches near the margin of the hind-wings on the under-side.

Melitæa Artemis, F.—Found commonly in Surrey and Hants, with the ground-colour entirely of a rich fulvous, but along with these are

other specimens in which the spaces between the black lines and bars in the *middle* of the fore-wings are filled in with yellow. In Pembrokeshire, where it is not scarce, specimens having the ground-colour entirely fulvous are uncommon, while those having the interspaces yellow are numerous. The lines and bands are also blacker, and more, or even all, of the interspaces are yellow, or the broad band near the margin of the hind-wings is of a clearer, brighter red, and outside this a row of yellow, or sometimes white, spots. Sometimes a band across the middle of the fore-wings is strongly suffused with black, at others the third row of black markings, counting from the hind margin, is *absent*, leaving a broad yellowish band, and occasionally in such specimens the markings of the under-side of the hind-wings are partially obliterated. These aberrations are found inland, and seem to be permanent.

Lasiommata Aegeria, L.—In South Wales the males of this species are darker, and apparently more velvety in appearance than those found further east, and the females have their spots larger and more yellow.

Lasiommata Megæra, L.—Abundant everywhere, and astonishingly constant, but one aberration occurred in a wood in the middle of Pembrokeshire; a female having the central band filled up with brown.

Satyrus Tithonus, L.—Also an abundant and usually constant species, but in some lanes close to the sea in Pembrokeshire specimens commonly occurred in which the dots or spots of the under-side of the hind-wings were more or less repeated on the *upper*-side. These spots varied in different specimens in number, from one to four, and sometimes they were white-pupilled; more rarely specimens were found with additional black dots on the upper-side of the fore-wings—either one or two in a line below the large bi-pupilled black spot. These spots occurred in both sexes, but did not always correspond on both sides of the specimen. All these supplementary spots are small and inconspicuous.

Satyrus Hyperanthus, L.—In Pembrokeshire, where it is abundant, this species exhibits the tendency so often seen in *Janira*, to decoloration of one wing, or part of a wing. One specimen, however, occurred in which the entire upper-side was of an olive-grey colour.

Canonympha Pamphilus, L.—In the lowland districts this abundant species is almost unicolorous on the upper-side, but in hill districts, such as Cannoek Chase, it assumes a darker brown margin.

Chrysophanus Phlæas, L.—About eighteen years ago, I met with several specimens—probably, half a dozen—at one time, on a grassy slope at the foot of one of the heather covered hills on the border of Sussex and Surrey, all of which had the coppery portion of the fore-wings decidedly suffused with blackish scales. A lady staying in the neighbourhood took others at the same place. All were found in the space of a few hundred yards or less, in a hollow of the hill-side, and although the insect was everywhere common, no similar specimens were seen in any other part of that district, or at any other time. But last summer I found the same form on a boggy heath within a few miles of Lynn; I could not get to the place in the earlier part of the day, but swept a few specimens of this butterfly from the grasses and rushes in which they were sleeping in the evening, of which several were more or less dark, and one—of the normal colour—had the black spots doubly wedge-shaped. The butterfly was common all over the district, but these varieties occurred only in a few yards of wet ground. A single specimen of a most striking aberration, having the hind-wings entirely black, and the fore-wings very broadly black-margined, and with the usual row of black spots nearly obsolete, was found in a lane close to another heath.

Lycæna Alexis, Hb., *Icarus*, Rott.—The form of the female, in which the wings are much suffused with blue, is not confined to the western districts, though certainly commoner in them. I have taken it in Surrey, but more frequently in Pembrokeshire; a specimen from the extreme north of Ireland is curiously dashed with white.

Syrichtus alveolus, Hb., *malvæ*, Hw.—I can vouch for one British example of the ab. *Taras*, as I took it myself more than thirty years ago in a large quarry on one of the limestone hills of Shropshire, and have it still. It must be very rare with us.

The general principles deducible from such observations as these must wait for further material, but some slight evidence of influences which may have tended to produce variation seems to indicate itself. In one species temperature seems to be influential, in another altitude, in several others the vicinity of the sea, and in still more, climate—increased rainfall or diminished sunshine.

But the influences which can cause a whole brood (apparently) to exhibit a particular tendency, yet not to transmit it to any descendants, are as obscure and difficult to arrive at as those which produce single and startling aberrations. Perhaps disease has a good deal to do with it; perhaps more exuberant health; most likely neither.

King's Lynn, Norfolk:
July, 1888.

ON THE SPECIES OF *CUCUJUS* FOUND IN JAPAN.

BY G. LEWIS, F.L.S.

When I was in Japan I briefly characterized a *Cucujus* as *coccinatus* in the Ent. Mo. Mag., xvii, p. 198, 1881, and rightly assigned it to a place in the Catalogue next to *bicolor*, Smith, to which it closely corresponds in form, especially in the lateral denticulations of the thorax, but *bicolor* has a bluish tinge, while *coccinatus* is black, except in the region of the elytra. Both have red elytra. *C. coccinatus* now appears to be confined to the Main Island and Kiushiu, for the specimens I refer to in my note (*l.c.*) as coming from Yezo, I find represent a distinct species, which I propose to call *C. opacus*. The differences between *coccinatus* and *opacus* are as follows: the head has the cephalic lobes in the male not more prominent than in the female of *coccinatus*; the thorax is less wide, and, therefore, more round, and the denticulations on the sides are much less prominent; the elytra are relatively shorter, much more lightly punctured, and remarkably opaque, not shining as in *coccinatus*. In 45 specimens of *C. coccinatus* before me, all have the sides of the thorax sparsely clothed with black hairs, and the examples of *opacus* are free of them.

The largest specimen of *Cucujus coccinatus* I have measures 15 mill., the smallest 10 mill. *Opacus* measures about 12 to 14 mill., but I have not a long series to base any measurements on. The colour of both insects is, as I have said, black, with the elytra alone red.

I took three specimens at Junsai, in S. Yezo, in September, 1880, and in Dr. Sharp's collection there is another, which has been found in sawdust containing insects from the same place.

The *Cucujus incommodus*, Walker (see Munich Catalogue), is, I believe, a species of *Psammæcus*, and this statement will not surprise any one who knows anything of the work of this naturalist at the British Museum. Leaving out Walker's species, the genus *Cucujus* to-day includes 11 species, as follows:—*Cucujus Mniszechii*, Grouvelle, 1874, Japan; *C. imperialis*, Lewis (*Davidis*, Grouvelle), 1881, China; *C. bicolor*, Smith, 1879, India; *C. Grouvelli*, Reitter, 1877, India; *C. coccinatus*, Lewis, 1881, Japan; *C. opacus*, Lewis, 1888, Japan; *C. caucasius*, Motschulsky, 1845, Europe; *C. hæmatodes*, Erichson, Europe; *C. sanguinolentus*, L., Europe; *C. puniceus*, Mannerh., 1843, America; *C. clavipes*, F., America; *C. coloniarius*, Olliff, Australia.

Wimbledon: August 14th, 1888.

DESCRIPTIONS OF THREE NEW *PHYTOPHAGA* FROM THE EAST.

BY JOSEPH S. BALY, F.L.S.

[The insects characterized form part of a small collection sent me for examination by the Calcutta Museum.—J. S. B.]

LEMA BIMACULATA.

Sub-elongata, sub-cylindrica, fulva, nitida, antennis, basi exceptis, elytroque singulo maculâ pone medium, nigris; thorace fere ad longitudinem aquilato, cylindrico, lateribus medio valde constrictis; disco lævi, ante basin transversim sulcato; elytris oblongis, utrisque decem seriato-punctatis, striis apicem versus sulcatis; striâ nonâ integrâ. Long., 3 lin.

Hab. : Andaman Islands.

Antennæ filiform, three or four lower joints fulvous or piceo-fulvous, the rest black. Thorax strongly constricted, the sides obliquely converging from the base to the middle, thence obliquely diverging to the apex; upper surface smooth, impunctate, transversely sulcate in front of the basal margin. Elytra oblong, convex, slightly depressed transversely below the basilar space, rather strongly punctate-striate, the striæ towards the apex sulcate, the second stria from the outer margin entire; each elytron below the middle with a small sub-rotundate black patch.

ENTOMOSCELIS METALLICA.

Oblongo-ovata, valde convexa, picea, nitida, corpore superiori pedibusque cupreo nitentibus; thorace convexo, distincte sed tenuiter punctato; elytris seriato-punctatis, punctis in striis inordinatis ad apicem confuse, dispositis.

Long., $3\frac{1}{2}$ —4 lin.

Hab. : Sikkim, Teste Valley, 2000—4000 feet.

Labrum piceo-fulvous. Thorax nearly twice as broad as long; sides nearly straight and parallel behind the middle, obliquely converging towards the apex anteriorly; disc convex, finely but distinctly punctured, the punctures irregularly congregated on the surface. Elytra scarcely broader than the thorax, oval, strongly convex, finely seriate-punctate, the punctures placed irregularly on the striæ, the latter lost before reaching the apex of the elytra.

Very similar in appearance to *E. assamensis*, mihi (Cist. Ent., ii, p. 437), separated from that species by the stronger metallic tint of the upper surface and legs, by the larger size, and by the more regularly punctured elytra.

GONOPHORA MASONI.

Elongata, modice convexa, fulva, nitida; thorace rude et crebre punctato, ante basin transversim sulcato, disco vittâ elevatâ lævi, medio longitudinaliter sulcatâ, et utrinque callo elevato, instructo; elytris sub-elongatis, lateribus parallelis, serratulis, apice conjunctim obtuse rotundatis, utrisque octo seriato-punctatis, elevato-tri-costatis; sub-nitidis, maculis quatuor, harum unâ infra

basin, secundâ majori ante medium communi, tertiâ quartâque vix infra medium, his oblique positâs, nigris notatis.

Long., 3 lin.

Hab. : Andaman Islands.

Antennæ about half the length of the body; vertex smooth, impunctate. Thorax distinctly broader than long; sides obliquely diverging from the base to beyond the middle, where they form a distinct angle, thence obliquely converging towards the apex, outer margin finely but irregularly serrulate; upper surface coarsely punctured, transversely sulcate just before the base, middle disc with a smooth elevated vitta, which extends from the anterior edge of the basal sulcation to the apical margin, its upper surface longitudinally grooved; on either side, about half way between the vitta and the outer margin, is a large strongly raised callosity. Elytra sub-elongate, parallel, obtusely rounded conjointly at the apex, the outer margin serrulate; each elytron with eight regular rows of punctures, arranged in pairs; the second, fourth, and sixth interspaces from the suture costate, the outer costa less strongly elevated than the others; spaces between the pairs of punctures transversely costate.

Warwick: *July*, 1883.

NOTES ON SOME BRITISH AND EXOTIC COCCIDÆ (No. 10).

BY J. W. DOUGLAS, F.E.S.

ORTONIA NATALENSIS, *n. sp.*

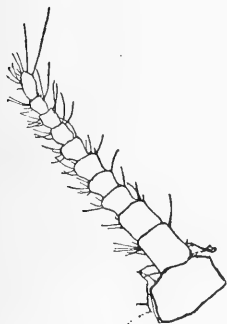


Fig. 1.

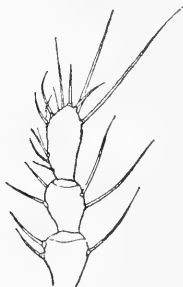


Fig. 2.



Fig. 3.

♀ adult, ovate, thick, soft, tumid, chrome-yellow, densely clothed above and beneath with short, flocculent, white matter, all segments visible, the margin all round with a close fringe of short, delicate hairs. Head obtuse, prominent; antennæ (Fig. 1; Fig. 2, terminal joints more enlarged) black, rather short, slightly tapering, 11-jointed, with projecting simple hairs, some of them very long; 1st joint very wide and short; 2nd and 3rd cylindrical, longest, 2nd longer than 3rd; 4th to 10th shorter, in length subequal, broad short-clavate, being smaller at the base than at the rounded apex, which, transversely, is narrowly yellowish; 11th longer, obtuse-fusiform, with two of the apical hairs very long. Eyes black, simple. Thorax transverse, middle depressed, sides prominent; posteriorly an elevated, somewhat angulated, scutellate area extends for a considerable space on to the base

of the abdomen. Abdomen distended, at the base narrower than the thorax; at the sides and posteriorly, but at a lower level, a well-defined broad border (connexivum), widened from the base onward to the middle, and giving to the abdomen its broad-oval contour; on the widely rounded apex of the abdomen beneath, at the base of the last segment, are three small papillate lobes, in a transverse line. Legs (Fig. 3) all similar, black, strong, with simple hairs of various lengths, longer, more slender and more distant on the outer side, more spinose and closer together on the lower side of tibiæ and tarsi, especially the latter; tarsi not half the length of the tibiæ, piceous; claws short, strong, without hairs, piceous.

Length, 7—8, greatest breadth, 4—5 mm.

Male unknown to me.

Of the family *Monophlebidae*, to which this Coccid evidently belongs, the characters of the genus *Ortonia*, so far as laid down by Signoret (Ess. Cochen., p. 401), (the female sex only being known), agree better than those of any other with this species, which does not appear to have been described in this or any other genus. In the antennæ there is great similarity to those of the larva of the ♀ *Guerinia serratulæ*, Fab. (Sign., Ess. Cochen., p. 390, pl. xviii, fig. 4a), inasmuch, as some of the anterior joints in that genus are short-clavate or pyriform, and the terminal joint has two clubbed hairs, but the other characters of the adult are dissimilar. Maskell has united *Guerinia* to *Monophlebus* in his "Account of the Insects noxious to Agriculture and Plants in New Zealand," p. 90. When the male of the present species becomes known, its true generic position can be better appreciated.

On June 23rd, Mr. R. T. Lewis, Mount Park Crescent, Ealing, had the kindness to send me five living examples of this insect, which, with others, had been received from Mr. J. R. Ward, Richmond, Natal, by Mr. G. Henderson, the editor of the "British Bee Keepers' Journal," and he has since most obligingly made some excellent camera lucida drawings, from which the accompanying illustrations are selected, the hairs shown being only those seen in profile, there being many others. The sender wrote as follows, under date May 16th:—

"I am sending in a match box some insects I obtained from a climber which grows under the tiles of a verandah; there are no leaves on the boughs under the tiles, and these insects lie in large numbers along the rough bark of the boughs."

In order to keep my specimens fit for examination, I killed them with the hydrocyanic odour of laurel as soon as I got them; but Mr. Lewis, who kept some alive, gave me the following interesting particulars on June 25th:—

"I am rather surprised to hear that the specimens I sent had lost their long cottony appendages before reaching you, as they were all fringed to a distance equal to fully two-thirds the length of their bodies when I packed them. I find

this morning that four which have been undisturbed, have now each made a mass of flocculent matter behind them considerably exceeding themselves in bulk, and in the midst of which numerous ova are deposited; these are of a pink-coral colour, minutely spotted with a deeper tint, they are not adhesive either to each other or to the substance upon which they are deposited. The specimens were sent by post, leaving Natal about May 14th, and certainly had no food for two months; on the way they deposited some thousands of ova, and they are still continuing the proceeding. If the flocculent material be removed, they appear to be able to reproduce it in the course of a few days."

PSEUDOCOCCUS ULICIS, n. sp.



Fig. 1.



Fig. 2.

♀ adult, oval, dull yellowish-green, plump, especially on the upper-side, covered with white powder, less so on the under-side, but the segmentation visible, the margin all round set with a series of snow-white, short, obtuse, horizontal projections, of which two at the anal extremity are larger and somewhat longer; a few fine hairs anterior to the rostrum, and one on each segment of the body laterally; no distinct anal ring, but there are a few (apparently six) delicate hairs. Antennæ (Fig. 1) yellowish, short, fine, of nine joints; 1st not short; 2nd one-third longer than 1st, longest of all; 3rd nearly as long as 2nd; 4th very short, shortest of all; 5th shorter than 3rd (4th and 5th together equal to 3rd); 6th, 7th, and 8th, each shorter than 5th, sub-equal, the apex a little wider than the base; 9th longer and thicker than the preceding, the apex obtusely produced; each joint with simple projecting hairs. Eyes small, simple. Legs (Fig. 2) yellowish, with simple hairs; tarsi one-third as long as the tibiae; claws short. The insect eventually quite covered with a close, cottony, white material, which appears to have a waxy base.

Length, 2.75—3, breadth, 1.75—2 mm.

Male unknown.

Signoret (Ess. Cochen., pp. 363—368) describes six species of *Pseudococcus*, but without figures, viz., *aceris*, found on maple, hornbeam, lime, and horse chestnut; *æsculi*, on horse chestnut; *brunnitarsis*, on borage; *hederæ*, on ivy; *mespili*, on medlar; *platani*, on plane. The present species differs from all of them, its specialities (in the ♀) being, the notable shortness of the 4th joint of the antennæ, the bluntness of the short marginal processes, the compactness of the ultimate covering, and the peculiarity of the habitat.

Some years ago, in the autumn, when hunting on Blackheath for *Lepidoptera*, I saw among the spines of a furze bush some white waxy

matter, which appeared to be the ruptured sacs of a Coccid, but it was too late in the season to be certain; and afterwards I could not follow up the indications, I believe of this species. In 1886, Mr. E. Parfitt, of Exeter, sent me some similar matter among spines of furze, of which nothing could be determined. In 1887 he forwarded some more examples earlier in the year; but these never reached me, having been appropriated whilst in transit by some gatherer and disposer of other men's goods: I fancy his disgust when he found the contents of the package were of no value—to him. This year, on April 24th, Mr. Parfitt sent a supply of the young forms, and on May 16th some more, of which two became encrusted with waxen matter, but out of one only came a Hymenopterous parasite; the others dried up. On June 2nd came more still further advanced from Mr. Parfitt, and finally, on June 18th, some fully developed, all females ready to spin up. These I intercepted in forming their covering, and described as above. Until the last these Coccids move freely about, but they then fix themselves at the base of a spine or shoot, and there make their covering; in this the eggs are laid, and when the larvæ escape the structure becomes ruptured and spread out, looking like bits of white wax among the spines.

I am indebted to Mr. R. T. Lewis for the illustrative figures.

8, Beaufort Gardens, Lewisham:

August, 1888.

THE LARVA, &c., OF *PHILOPOTAMUS*.

BY KENNETH J. MORTON.

The pretty and active members of the genus *Philopotamus* frequent rapid streams and torrents, and they delight especially in those whose beds are strewn with moss-covered boulders. I fancy in some favoured localities they must occur nearly all the year round; in this quarter I have seen *Ph. montanus* in at least six months of the year (April to October), and I have no doubt that at any time during the period indicated that species could be obtained in all conditions of growth and advancement. For instance, in the middle of April, this year, I found at the same streamlet larvæ ranging from a small size to full growth; nymphs of all grades, from those just changed from larvæ to those which displayed all the colours and parts of the perfect insect; and finally, the perfect insects themselves.

Philopotami are essentially creatures of dashing waters, and their larvæ succumb almost at once if placed in still water of any depth,

indeed, they rarely survive such an immersion more than a few hours. Thus any attempt to rear them should be made in a wide vessel with very shallow water, if a mechanical contrivance for keeping the water in a highly aerated condition cannot be employed. Pictet knew the larva and nymph of one or more species, and gives some interesting account and figures in the "Recherches."

The larvæ do not make any case worthy of the name, but live concealed in large loose webs spun between stones. The nymph cases on the other hand are strong structures, elongate heaps of comparatively large stony fragments fixed to large stones, with a silken lining which forms a complete envelope round the nymph.

The larva of *Ph. montanus* has the head and pronotum orange, the latter margined laterally and posteriorly with black; legs yellowish, with blackish markings at their insertion; anal claws also yellowish; meso- and meta-thorax whitish. In form it is elongate, and the abdomen, whose segments are well defined, tapers gently to the posterior end. Seen from above the head is elongate, slightly emarginate in front; antennæ minute, seen under a high power apparently consisting of two short, simple branches.* Pronotum somewhat quadrate, slightly narrowed posteriorly. The two other thoracic segments differ from the abdominal ones only in being a little larger. The legs are short, the pairs nearly equalling one another in length; tarsal claws very short. The anal limbs are rather short and stout, with a strong much curved claw. Anal filaments present, but no lateral filaments. The whole larva sparsely covered with hairs. Of the mouth parts the most remarkable is the labrum, which resembles the same part in *Wormaldia*, but is less conspicuous in comparison. It is white, and appears to be of softer consistency than is usual in Trichopterous larvæ; when fully exerted, it expands into two transverse lobes, with closely ciliated fore-margins and a long fringe at the side. Mandibles large and falcate, the tip forms a large tooth; going towards the base follow two smaller teeth, then an indistinctly crenate part; about half way to the base the mandible is obtusely angulate and becomes broader. First maxillæ with four-jointed palpi, lacinia strongly fringed and armed with spines. The other parts form the spinneret, which is large, obtuse and provided with minute processes, which may represent the palpi of the second maxillæ. The nymphs approaching maturity are easily made out, especially the ♂, the anal parts of which closely resemble the corresponding parts of the perfect insect, as is the case

* Similar to those of *Wormaldia*, which *Philopotanus* much resembles in all respects. At description of *Wormaldia* will be found in Trans. of Nat. Hist. Soc. of Glasgow for 1886-7, p. 115 (I think not yet published).

in *Rhyacophila*. They possess fringes on the second pair of legs. No external respiratory filaments. The mandibles are long and broad, with four large teeth at the apex.

Around the typical form of *Ph. montanus* cluster a number of colour forms. While it would certainly be interesting to trace these through all stages, I fear such study would not do much towards the definition of the relative value of the various forms. In some groups of *Trichoptera* the appreciable differences in the larvæ seem to go little beyond what is generic.

Carluké, N.B.: *August 9th*, 1888.

Vanessa Antiopa in the Isle of Wight.—This afternoon I captured a fine specimen of this butterfly, with the usual pale border, in the gardens of the Totland Bay Hotel, Isle of Wight, flying over the flowers of the privet, which was in profusion. Although I have collected insects for the last fifty-five years, this is the first time I have seen it on the wing in England; *Io*, *Atalanta*, *polychloros*, *urticæ*, and *cardui* were more or less abundant, flying over the same flowers.—SAMUEL STEVENS: *August 14th*, 1888.

Deilephila galii at Harrogate.—On the 26th of last month I took a specimen of this insect hovering over a plant of *Delphinium formosum* in a garden in Harrogate, about 9.15 p.m. The occurrence of this Sphinx in Yorkshire is so rare, that I think the capture is worth recording.—BEN. BLAYDES THOMPSON, Harrogate: *August 13th*, 1888.

Catephia alchymista.—In reference to the capture of *Catephia alchymista* at St. Leonard's, by Mr. Saunders, last month, I beg to say that I have two male specimens of that moth in my cabinet, which were taken by a gentleman of the name of Harris, at Bembridge, in the Isle of Wight, in July, 1867. The locality was a wood between Bembridge and Brading. They are both males, and in fair condition, but badly set, and evidently by an amateur.—HENRY BURNEY, Wavendon Rectory, Woburn: *July 31st*, 1888.

Chrysoclista bimaculella.—I had always been under the impression that the *bimaculella* of British Authors, and the *bimaculella* which comes to us from Vienna, were one and the same species. A recent letter from Lord Walsingham has, however, called my attention to the fact that the two insects are not identical. British specimens of *Chrysoclista bimaculella* are, I believe, few and far between: are they all alike? or do any of them put on the form of the Vienna insect? I should much like to hear from any Entomologist who is the happy possessor of one or more British specimens of *Chrysoclista bimaculella*. The insect has been suspected to frequent willows; but I never heard of it occurring in any numbers—like *Chrysoclista Linneella*.—H. T. STANTON, Mountsfield, Lewisham: *August 13th*, 1888.

Where does Gonepteryx rhamni hibernate?—Can any of your readers give me an account from their personal experience of the situations in which *Gonepteryx rhamni* hibernates in this country? I am interested in the question of the protective markings on the under-sides of butterflies' wings, and desire information about the species which hibernate in this country. All the *Vanessidæ* have dark coloured under-sides which serve to conceal them in the crevices in which they hibernate. *G. rhamni*, although the wings are strikingly like the green leaves of trees, appears to be an insect unprotected during hibernation, owing to the absence of anything like a green leaf during the winter. It is possible that in this case there is no hibernation of the perfect insect, and it is simply a case of the retardation of the pupa, so that the insects that we see on the warm days of winter or early spring, have recently emerged.—GEO. H. KENRICK, Whetstone, Somerset Road, Edgbaston: July 30th, 1888.

Note on the larva of Anthithesia ustulana, Haw., = fuligana, Hüb.—I am glad to be able to give some account of the larval habits of *Anthithesia ustulana*, which I think has generally been referred to as occurring amongst *Stachys sylvatica*, and, until quite recently, has been considered identical with *A. carbonana*, Dbld., whose larvæ feed in the stems of *Stachys palustris*, in the autumn. For several years *ustulana* has been common, at times, on a railway embankment down here, and lately I had noticed that it was always confined to places where patches of bugle (*Ajuga reptans*) were growing. Examining these plants last September I found young larvæ feeding in the root-stock just above the surface of the ground. They were of a dirty white colour, and exceedingly small, remaining so throughout the winter. Towards the middle of March they commenced feeding again, hollowing out the root-stock, and mining up the stalks of the leaves, their previous colour then becoming tinged with pale yellowish-green. At the end of May they were full-fed, and pupated in various positions, some in the empty mines and others outside amongst the leaves. The moths emerged the middle of June. As all the larvæ were found in plants that were protected by furze bushes, &c., it is probable that the eggs are deposited in the seed heads; the young larvæ feeding down the stems to the root. There were no traces of any in the plants growing in the open, where the stems would be destroyed when the herbage is cut at midsummer.—G. W. BIRD, Honor Oak Park, S.E.: July 18th, 1888.

Crambus ulæ, Cockerell, = C. luteolellus, Clemens.—In the May number (vol. xxiv, page 272) I described a supposed new *Crambus* as *C. ulæ*. I sent the type to Professor Fernald, who replies as follows:—

"I regret to say that Mr. Edwards has led you into re-describing an old and well-known species of *Crambus*. It was first described by Clemens as *C. luteolellus*, next Zeller described it as *C. hemiochrellus*, then Grote described it as *C. duplicatus*, afterwards I described it as *C. zeelus*, and now you have described it as *C. ulæ*! A much described species!!—C. H. FERNALD, Amherst, Mass: June 14th, 1888."

No doubt Professor Fernald's *dictum* must be taken as final on the subject, and I need hardly say I am sorry to have been led into error so easily.—T. D. A. COCKERELL, Colorado: July, 1888.

Non-development of a wing in Melitæa.—A few days ago I captured, in this locality, a specimen of *Melitæa minuta*, Edw., which had the normal appearance except in one respect—that the right lower-wing had failed to expand more than to a very slight degree, and presented just such an appearance as the wing of a ♀ *Orgyia antiqua*. There can be no doubt that this malformation was due to an abnormal coalescence of the walls of the veins of the wings, and their occlusion in consequence—adding another case to the many already known in which what is quite abnormal and pathological in one species is normal in another; for the so-called apterous females of certain moths may well be supposed to have descended from winged forms, and to be, in fact, perpetuations of a condition which was once as truly pathological in them as it is now in *Melitæa*. The extraordinary variety of *Ocneria dispar*, which has the lower-wings notched, and breeds true in captivity,* is probably of like nature, and further illustrates this phenomenon.—ID. : *July 17th*, 1888.

Migratory swarm of Libellula quadrimaculata off the Essex coast.—The following came this morning from the master of the "Swin Middle" light vessel, off the Essex Coast. You will, perhaps, like to take note of it.—JOHN CORDEAUX, Great Cotes, Ulceby : *July 26th*, 1888 :—

"I do not know whether these insects will be of any interest to you, but, being strangers to me, I take the liberty of sending them. On June 23rd, from 6 to 8 p.m., a flock of them came on board and rested on the ropes, and even on the cable the vessel was moored with from the bows down close to the water's edge. The wind was E. by S., and the weather fine and clear, and I told the man on watch to catch a few, which I forward. I never saw anything like it before.—S. PENDER, 21, Abbott Road, Poplar, E. : *July 24th*, 1888."

[The insects are *Libellula quadrimaculata* in both sexes. Enormous migratory swarms have many times been remarked on the continent. The species is no rarity here, but somewhat local, and I think this is the first record of a migratory swarm in this country. The "Swin" is not far from Shoeburyness, and therefore practically at the mouth of the Thames. According to the direction of the wind they, in all probability, came from Holland, and contrived to arrive just before nightfall.—R. McLACHLAN.]

Molanna palpata, McL., in Ireland.—This Trichopteron occurs in considerable numbers along the Shannon near here. It is the first time I have taken it near a river, although I have captured the species at many localities in Scotland, where, according to my experience, it is always attached to boggy lakes.—JAMES J. F. X. KING, 6, Garden Vale Terrace, Athlone : *August 16th*, 1888.

Note on Orthotrichia angustella and its case.—In Ent. Mo. Mag., vol. xxiii, p. 202, a minute caddis case is noticed, from which I reared a Hydroptilid, referred with much hesitation to *Orthotrichia angustella*. The same case has again been sent me by Mr. Bolton, of Birmingham, and the perfect insect once more reared. Unfortunately I was absent from home when the fly came out, and it was dead and dry, adhering to the side of the tube, on my return. A careful microscopical examination of the remains serves to strengthen my belief in the correctness of the

* "Entomologist," 1878, p. 170, and fig.

former determination, and I think *Orthotrichia angustella* may be safely considered the maker of the case figured on page 172, vol. xxiv (fig. 6).—KENNETH J. MORTON, Carluke, N.B.: *August 9th*, 1888.

Notes on Japanese Hispidæ.

Leptispa Godwini, Baly, from Japan.—There are so few *Hispidæ* known from Japan (only five) that it seems worth while to record the above species as having been captured near Tokio. It is a species allied to *L. pygmæa*, Baly, from Ceylon, but it is wholly black, and has a small longitudinal sulcus on the head between the eyes, and the apices of the elytra are much more reflexed. I found *L. pygmæa* in abundance near Colombo, the insects were resting on the stems of a small grass just above water, but if immersed, remained quiescent beneath it. In *pygmæa* the body beneath is covered with the close pilosity common to some insects (such as *Donaciæ*) which are indifferent to immersion in water, but in *Godwini* the body is smooth, and I have no doubt it is less aquatic in habit.

Hispa japonica, Baly, Trans. Ent. Soc., p. 215, 1874, = *Hispa agulosa*, Solsky, Hor. Soc. Ent., Ross., viii, p. 262, of prior date.—GEORGE LEWIS, Wimbledon: *August 5th*, 1888.

Review.

A SYNOPSIS OF THE APHIDIDÆ OF MINNESOTA: by O. W. OESTLUND, Geol. and Nat. His. Survey, Bull. 4. 1887.

The author of the above-cited synopsis commences with a general description and terminology of the *Aphis* Family, which is followed by a short account of its metamorphosis. Although it may be well to take note of what Lichtenstein has done as to the metamorphosis of these insects, it is, perhaps, a matter of regret that in this memoir his phraseology of "*Pseudogyna migrans*," "*gemmans*," and "*pupifera*," has been adopted.

On looking down the list of species, we are struck by the array of new names, and by the paucity of those known to the European Entomologist. That new forms should occur in America is what we might expect, yet every authentic example of the spread across the Atlantic Ocean of European species must be of great general interest, especially when such examples occur where there is no reason to suppose their recent importation through economic sources.

Without an opportunity of comparing living European and American examples, or at least collating such with coloured drawings, much risk is run of confusion. In this synopsis our suspicions are raised that several familiar friends appear in new dresses. The sub-family *Aphidina* is restricted to these insects, which show from six to seven joints in their antennæ; and an attempt is here made to render more easy the identification of species by the use of synoptical tables. These last are admitted to be more or less of an artificial character, and thus they are offered only as "serviceable to the recognition of species difficult to separate."

The genus *Aphis*, as was before attempted by De Geer, is here divided into (a) *Aphis pemphigini*, comprising those species which twist or curl the leaves of plants, and (b) *Aphis genuini*, which embraces those numerous genera which presumably do not produce contortions of foliage.

Afterwards, a new tribe is constituted, viz.: *Nectarphorini*, which, from its name, ought to include all forms which secrete honey-dew, or bear siphuncles. Reasons are given for eliminating Koch's genus, *Siphonophora*, and the well-known names for the *Aphides* of the rose, the pea, and the wheat; but it is doubtful if any substantial gain is got by this change. In a similar manner the labours of Westwood and of Planchon are unrecognised by the change of the usual name, *Phylloxera vastatrix*, to *Phylloxera vitifoliae*. It is true that, in 1856, Asa Fitch noted certain galls on the leaves of the grape vine, but it is believed that he published no history of this insect, neither did he place it in its true position amongst the *Chermesinæ*. The author of the synopsis considers the drum-like tubercles so commonly seen on the antennæ of *Aphides* to be either organs of hearing or of smelling; and he thinks that they are sufficiently constant in position to afford reliable specific characters. If these knob-like masses are referable to either of these senses they would seem better to represent ear-tympani than any known olfactory structure.

Mr. Oestlund's memoir adds several new species to the fauna of America. It has also an interest in the statement of the occurrence on that continent of the hitherto unique British insects, *Melanoxanthus salicis*, and *Amphorophora ampullata*. The work has been conscientiously done, but its chief value will, of course, be appreciated by western Entomologists. A short bibliographical list, wholly confined to American authors, is appended. For those who would take up the complete study of a somewhat difficult group of insects, an acquaintance with the early works of Kaltenbach, Koch, Passerini, and others is imperative. To those authors we are mainly indebted for what we know of the *Aphididæ*.—G. B. BUCKTON.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY :
 July 26th, 1888.—JOHN T. CARRINGTON, Esq., F.L.S., Vice-President, in the Chair.

Mr. T. S. Hillman, of Lewes, was elected a Member.

Mr. Frohawk exhibited the white-banded variety of *Sesia culiciformis*, L., taken by him at West Wickham, June, 1887, shortly afterwards recorded in "The Field." Mr. Tugwell remarked that it was the first white-banded variety of this species he had seen. Mr. West, of Streatham, *Dianthæcia capsicola*, Hb., bred from larvæ found on Sweet Williams. Mr. R. Adkin, short series of *Zonaria orbicularia*, Hb., inbred from New Forest larvæ, the specimens showing a good deal of variation; living larvæ of *Thera firmata*, Hb., remarking on their close resemblance to the Pine needles, and of *Tephrosia punctularia*, Hb., the larvæ when first hatched being of a green colour, since moulting, however, there were some of a mottled brownish colour, while others were green. Mr. E. Joy, *Leucania impudens*, Hb., from Wicken Fen. Mr. Robson, a variety of *Argynnis Euphrosyne*. Mr. Tugwell, two specimens of *Eupithecia extensaria*, Frr., from King's Lynn; also specimens of *Melanippe fluctuata*, L., and var. *costovata*, which he was of opinion had no claim to a varietal name. Mr. Carrington, a specimen of *Sirex gigas*.

August 9th, 1888.—THE VICE-PRESIDENT in the Chair.

Mr. R. Waller, of Clapham, and Mr. J. N. Young, of Rotherham, were elected Members.

Mr. Cook exhibited a variety of *Smerinthus tiliæ*, L., the lower part of the

central band on the superior wings being absent. Mr. Wellman, bred examples of *Plusia Chryson*, Esp., and *Eugonia autumnaria*, Wernb., and stated he had bred nine females and only two males of the latter. Mr. Joy, bred specimens of *Geometra vernaria*, Hb., and *Pseudoterpna pruinata*, Hufn. Mr. C. A. Briggs, *Zygæna meliloti*, Esp., taken this year by Mr. Meek in the New Forest. Mr. Robson, living larvæ of *Panolis piniperda*, Panz. Mr. Carrington, specimens of *Boarmia repandata*, L., sent him by Mr. Batty, and called attention to the melanic appearance of the specimens; this exhibit gave rise to a discussion on Melanism, Messrs. West, Weir, Step, Carrington, and others taking part. Mr. West, of Streatham, exhibited a short series of *Homæosoma sinuella*, H., taken near Brighton. Mr. Weir, an example of *Myrmeleon europæus*, bred by him from a larva taken at Fontainebleau, 1887.

Mr. Carrington made some observations on a fortnight's collecting on the Chiltern Hills, and as to the late appearance of various species of *Lepidoptera*.

Mr. Weir read an extract from a letter from Mr. Cockerell, dated 21st May, 1888, referring to *Gonepteryx Cleopatra* and *rhamni*.—H. W. BARKER, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON: Aug. 1st, 1888.—Dr. D. SHARP, F.L.S., President, in the Chair.

The Rev. R. Walton-Lewis, B.A., of Cape Colony, was elected a Fellow of the Society.

Mr. F. Du Cane Godman, F.R.S., exhibited a large number of species of *Lepidoptera* and *Diptera* recently collected for him in Mexico by Mr. Herbert Smith.

Mr. White exhibited parasites bred from *Bombyx neustria*, and a living example of *Hetrodes Guyoni*, found at Dartford, and believed to have been introduced with Esparto grass from Tunis.

Mr. Enock exhibited a stem of barley, showing the appearance of the plant under an attack of Hessian Fly.

Mr. Stevens exhibited a number of galls collected at Byfleet, Surrey, in July last, by Mr. Leonard Stevens; also a specimen of *Coleophora solitariella*, with ichneumons bred from it.

Mr. Edward Saunders exhibited a specimen of *Catephia alchymista*, captured by his son at St. Leonards, in June last. He also exhibited specimens of a rare Ant (*Anochetus Ghiliani*), taken at Tangier by Mr. G. Lewis. One of these he had submitted to Dr. Emery, of Bologna, who thought that, although ocelli were present, the specimen was probably intermediate between a worker and a female, and that possibly the true female did not exist.

Mr. Pascoe exhibited a number of species of *Coleoptera* recently collected in Germany and the Jura Mountains, and read a note correcting the synonymy of certain species of *Brachycerus* recently described by him in the "Transactions" of the Society. He stated that the corrections had been suggested by Mons. Péringuey and Mons. Aurivillius.

Prof. Westwood communicated a paper entitled "A List of the Diurnal Lepidoptera collected in Northern Celebes by Dr. Sydney Hickson, with descriptions of new species."—H. GOSS, *Hon. Sec.*

LIST OF BRITISH *TIPULIDÆ*, &c. ("DADDY-LONGLEGS"),
WITH NOTES.

BY G. H. VERRALL, F.E.S.

(Concluded from page 27).

CTENOPHORA.

- 1 (4) A small blackish-brown spot at the stigma, which does not nearly reach the discal cell.
- 2 (3) Abdomen black, with side markings yellow, or reddish-yellow with black dorsal spots *pectinicornis*, L.
- 3 (2) Abdomen black with yellow bands *flaveolata*, F.
- 4 (1) A large brown blotch at the stigma, which extends to the discal cell...
ornata, Mg.

C. ornata, Mg.: in this Magazine (vol. xviii, p. 88) Mr. C. W. Dale recorded what he believed to be the second British specimen of this handsome insect; as a matter of fact, I believe it was the first female taken in Britain, but I caught a male, also at Lyndhurst, on June 30th, 1874, which is the only true *Ctenophora* I have ever seen alive.

[Another dark coloured *Amalopis* with unspotted wings has been given me by Baron Osten-Sacken, who caught it on the Pyrenees on July 13th, 1887. I describe it shortly as follows:—

A. PYRENAICA, n. sp. (♂).—*Cinereo-brunnea, pedibus basi et alis fere totis flavidis, cellula sub-marginalis prima secundâ brevior; cellula posterior quarta longa, sessilis.*
Long. corp., 12 mm.

Frons and vertex greyish-brown, rostrum blackish, palpi blackish; antennæ blackish, 1st joint elongate, 2nd considerably swollen and longer than the following joints, which are at first globose but become gradually more cylindrical; they bear rather short hairs.

Thorax somewhat yellowish-grey, but almost all occupied by the shining dark brown lines, the middle one is very broad and faintly divided, extending right up to the front, but behind seeming to coalesce with the side lines, which are narrower and do not extend far forwards; halteres yellow, stem very long, knob obscure.

Abdomen brown, extreme margin yellowish; genitalia dull ochreous; pubescence short, yellow.

Wings almost all yellowish, especially about the costal, mediastinal, sub-costal and postical veins; the venation is almost identical with *A. occulta*, Mg., the præfurca being rather long and appendiculated, the first sub-marginal cell distinctly shorter than the second, the discal cell incomplete, and the fourth posterior elongate, commencing even before the great cross vein, so that an almost continuous line of cross veins runs from the base of the first sub-marginal cell to the great cross vein, this line is obvious to the naked eye, but is scarcely clouded in any way; the second posterior cell (= the fork) is long, being almost as long as its stem; the fourth posterior cell has its sides straighter than in *A. occulta*, Mg.

Legs blackish, only the coxæ, trochanters, and basal two-fifths of femora orange; spurs inconspicuous, yellowish.]

ON COLLECTING AND SETTING *TIPULIDÆ*.

A few words on collecting and setting, and then my paper is done. I have collected all my *Tipulidæ* just like butterflies; a chip box for each, only with small species there is no harm in more than one specimen being in a box. Care must be taken not to shut the legs against the lid, and if there be any rough splinters inside the box they are very liable to pull off their legs against them. Sweeping for them is almost useless, except with very small species, as it knocks them to pieces. When brought home in the chip boxes I kill a few at a time in an ordinary cyanide bottle, and set as soon after death as possible, as otherwise the legs are bound to come off; I use ordinary English entomological pins, pinning the specimens through the middle of the thorax, and leaving them about half-way up the pin; then I add a circular label (punched with an old gun-wad punch), on the under-side of which has already been written the locality and date. After a little practice this label may be made very useful for arranging the legs and wings; these latter I extend just as one would for a *Pterophorus*, the legs look best when the middle pair are behind the wing, but often to avoid breaking them off, they must remain under or in front of the wings; they soon dry, and then do not readily come to harm. The continental method of pinning is to use the very long pins, and push the specimen up at least three quarters of the pin, and only slightly arrange the legs and wings, if at all. I would specially emphasize the labelling, as specimens without a history are almost valueless.

ADDENDA ET CORRIGENDA.

Vol. xxiii, page 118. Put *Acyphona imbuta* in a separate genus = *Chilotrichia*, Rossi. Put *Ephelia decora*, Hal., as a synonym of *E. marmorata*, Mg.; I have seen this correction in Haliday's own writing in a "Curtis' Guide" which Haliday sent to Loew, and which Baron Osten-Sacken now possesses, otherwise, as Loew truly remarks, the description seems different. After *Limnophila discicollis* add *L. subtinctoria*, Ztt. *Limnophila senilis*, Hal., is, I believe, the *Cladura fuscata* of Loew, but is not a true *Cladura*, in Osten-Sacken's sense; Professor Mik thinks it will form a distinct genus. Page 119, after *Amalopsis immaculata* add *A. claripennis*, n. sp.; before the genus *Cylindrotoma* put *Phalacroceras*, Schin., *replicata*, L.; after *Tipula marmorata* add *T. signata*, Stæg.; and after *T. scripta* add *T. excisa*, Schum. Page 122, at 23, *Phalacroceras* should come in; it has a dull blackish appearance, while *Cylindrotoma* is black and yellow, almost like a *Pachyrrhina*: at 33, *Chilotrichia* has the sub-costal cross vein at the end of the medias-

tinal vein, while *Acyphona* has it long before the end. Page 159, line 8, *D. lutea* has no process from the male genital lamella; I expect this error crept in from an unnoticed *D. mitis*, in which species the process is very conspicuous. Page 265: I have already called attention that the second clause of 18 should be omitted, it being in its right place at 26; at 22 should come in *L. subtineta*, Ztt., with clouded cross veins, these being almost uncoloured in *L. discicollis*, Mg. Vol. xxiv, page 111, before *A. immaculata* in the table will come *A. claripennis*, n. sp.; medium sized, ground colour yellowish-grey, male genitalia and base of ovipositor ochreous, as against the smallish species with black-grey ground colour, and having the male genitalia and base of ovipositor blackish. After *A. occulta* in the notes should come

A. CLARIPENNIS, n. sp. (♂ ♀).—*Flavido-cinerea; thorace lineis quatuor fuscis; abdomine ochraceo-fusco, basi, lateribus et genitalibus ochreis; alis hyalinis, basi flavidis.*
Long. corp., 8 mm.

Head blackish-grey, rostrum near end obscurely ochreous; palpi blackish-grey; antennæ 17-jointed, joints not crowded together, basal joint elongate, greyish, rest black, globular-oval, and bearing short hairs.

Thorax light yellowish-grey, with four somewhat shining dark brown lines and humeral pit, the middle pair of lines close together, extending to front but not to back, side pair abbreviated in front but extending to back; pleuræ yellowish-grey; halteres dirty yellowish, knob brownish.

Abdomen dark brownish, the base, lateral stripes and genitalia ochreous, the middle segments obscurely ochreous; in the female the base of the ovipositor is ochreous.

Wings hyaline, considerably yellowish about the base; the first sub-marginal cell is sometimes considerably, sometimes only a little, longer than the second; a discal cell is often present—in my twelve specimens three have a discal cell on both wings, five on neither wing, three on the right wing only, and one on the left wing only; when the cell is present, the upper vein from it is forked, and the stem is nearly twice as long as the fork; in one specimen the second sub-marginal cell is petiolate on the right wing, the neuration then would be identical with *Tricyphona*, only the connecting vein closing the discal cell happens to be present. The præfurca is short, sometimes very short, about midway between the sub-costal and marginal cross veins; the great cross vein is very sloping.

Legs dark brown, femora ochreous until after the middle, often almost to tip; coxæ and trochanters yellowish, sometimes the extreme base of the coxæ is obscure; spurs small, ochreous.

I know no European species at all allied to this; the dark colour, clear wings, and medium size at once distinguishing it. I caught one at Frant on June 4th, 1886, and then found it abundant in Wales, especially about Barmouth, early in June, 1887. Professor Mik showed me last January some Austrian specimens.

Sussex Lodge,
 Newmarket.

ON THE BRITISH SPECIES OF THE GENUS *CIXIUS*.

BY JAMES EDWARDS, F.E.S.

The following species of this genus are noticed by Mr. Scott in his Revision of the *Cixiidae*, in vol. vii of this Magazine, p. 121, *et seq.* :—

1. *cunicularius*, Fab.
2. *nervosus*, Linn. The very long recurved teeth of the anal tube in the ♂ of this common species are very characteristic.
3. *intermedius*, Fieb. This is a synonym of the next species, *teste* Fieber, Cicad. d'Eur., pt. ii, p. 179.
4. *brachycranus*, Fieb.
5. *contaminatus*, Latr., = *pilosus*, Ol. This is, so far as I know, our only representative of the group which is characterized by having the marginal nerve granulate between the nerves of the membrane.
6. *stigmaticus*, Germ.
7. *simplex*, H.-Schff. This is not the true species of that name, and I, therefore, propose to call it *C. Scotti*.
8. *similis*, Kbm. Scott's species not being the same as Kirschbaum's, I propose to call the former *C. remotus*. I am indebted to the kindness of Mr. C. W. Dale for the opportunity to make these corrections with regard to this and the preceding species.

The more salient characters of the two last named species may be briefly stated as follows :—

CIXIUS SCOTTI.= *simplex*, Scott.

Head black, with brownish-yellow keels. Pronotum brownish-yellow, beyond the side keels black. Scutellum black, the middle keel generally brownish-yellow. Elytra lacteo-hyaline, nerves white, stigma black, apical areas frequently with fuscous blotches; the inner margin generally with two black streaks, one adjoining the apex of the axillary nerve, and the other a little nearer the base; opposite to the latter streak there is frequently a trace of a fuscous transverse band; nerve granules oblong, narrowed at each end, costal granules 12--14, occupying the whole width of the nerve. Anal tube and styles similar to those of *C. remotus*, but the aperture of the former is transversely oval.

This species is probably not uncommon in the South; I have several examples from Mr. Dale, and Mr. Saunders has taken it at Penzance.

CIXIUS REMOTUS.= *similis*, Scott.

♂. Head black, with brownish-yellow keels. Pronotum brownish-yellow,

beyond the side keels black. Scutellum black. Elytra lacteo-hyaline, nerves white, stigma blackish, nerve granules oblong, distant, those of the costa 9 or 10, occupying the whole width of the nerve. Styles brownish-yellow, their inner angle bluntly prominent, and their hind margin rounded. Anal tube black, the lower half of the apical ring brownish-yellow, and produced into two large, blunt, triangular, spreading, dusky, recurved teeth, aperture roundish. Legs brownish-yellow, more or less striped with fuscous.

I have only seen a single example of this species.

In addition to these, we have the true *C. similis* of Kirschbaum, of which I append a short description:—

CIXIUS SIMILIS, Kbm.

Head black, with brownish-yellow keels. Pronotum brownish-yellow, beyond the side keels black. Scutellum black. Elytra pale brown, sometimes mottled with darker, nerves whitish, their granules roundish, moderately close, costal granules large, distant, roundish, 8—10 in number, not occupying the whole width of the nerve, but placed at irregular intervals, rather on its inner edge. Legs brownish-yellow, thighs black, except at the extreme base and apex. Styles brownish-yellow, hatchet-shaped, their hind margin straight. Anal tube black, its apical ring oblique, without teeth, aperture roundish.

This species occurs near Norwich, in the Hastings district, and Mr. Saunders has taken it at Woking. I formerly mistook it for *C. stigmaticus*, Germ.

The following is an attempt to tabulate the essential characters of the British species of this genus:—

- | | | |
|----|---|--------------------------|
| 1 | (2) Costal granules not, or scarcely, larger than those of the other nerves... | 1. <i>pilosus</i> . |
| 2 | (1) Costal granules distinctly larger than those of the other nerves. | |
| 3 | (12) Nerve-granules round or roundish. | |
| 4 | (11) Costal granules more than 10. | |
| 5 | (6) Elytra with a broad, transverse, fuscous band proceeding from the stigma to the inner margin, an ill-defined fuscous spot in the apex of the wings... | 2. <i>cunicularius</i> . |
| 5 | (5) Elytra without a transverse band proceeding from the stigma. | |
| 7 | (8) Anal tube with two long recurved teeth at the apex | 3. <i>nervosus</i> . |
| 8 | (7) Anal tube without teeth. | |
| 9 | (10) Styles (viewed from the side) hatchet-shaped | 4. <i>stigmaticus</i> . |
| 10 | (9) Apical lobes of the styles (viewed from the side) wide, triangular, with rounded angles | 5. <i>brachycranus</i> . |
| 11 | (4) Costal granules 8—10 | 6. <i>similis</i> . |
| 12 | (3) Nerve granules distinctly oblong. | |
| 13 | (14) 12—14 costal granules | 7. <i>Scotti</i> . |
| 14 | (13) 9 or 10 costal granules | 8. <i>remotus</i> . |

MELANISM IN BIRMINGHAM AND SOUTH DEVON.

BY R. C. R. JORDAN, M.D.

In the following comparative list of melanic species which occur in Birmingham and Teignmouth, the term melanism is confined to cases where the whole anterior wing is suffused with black, or at least a much darker hue than usual.

Agrotis segetum—anterior wings entirely black. This form is more common at Teignmouth than at Birmingham. The explanation of this seems to be that it is much more frequent in the second brood, which occasionally occurs in the south, but is here unknown.

Miselia oxyacanthæ—anterior wings a dark blackish-umber. As far as my experience goes, unknown in the south; at Birmingham occasional.

Apamea oculea—the typical form is the commonest in both places; but the black form (*lugens*), with or without the white stigma, occurs occasionally.

Miana strigilis—the form *æthiops* is occasional at Teignmouth, but almost the only form at Birmingham.

Tæniocampa incerta—anterior wings black. Not rare at Birmingham; at Teignmouth unknown.

Hibernia progemmaria—male, with the anterior wings entirely sooty-black; female, rudimentary wings deep black. Occasional at Birmingham; at Teignmouth unknown. The usual southern form of *progemmaria* is always much lighter in hue than the Birmingham specimens.

Amphidasis betularia—all the wings deep black. Occasional at Birmingham; unknown in South Devon.

Oporabia dilutata—anterior wings entirely greyish-fuscous. Frequent at Birmingham; I have no specimens from South Devon.

Ypsipetes sordidata—anterior wings entirely dark fuscous. Occurs in both localities; more frequent at Birmingham.

Steganoptycha nevana—anterior wings deep blackish-umber. Not rare at Birmingham; at Teignmouth unknown.

Hedya ocellana—the form with the anterior wings entirely black. Occurs in both localities.

Dictyopteryx contaminana—as far as I have seen, the form with the anterior wings unicolorous brown (*rhombana*) occurs only at Birmingham.

Peronea variegana—a form with the anterior wings black, having a steel-grey gloss, and no marks except the raised scales. Occurs occasionally at Birmingham only.

Pæcilochroma corticana—anterior wings velvety-black, with a green shade. Occurs at Birmingham; at Teignmouth the insect is always green or greyish-green with darker markings. I have once taken the form of *Lophoderus ministranus*, called *ferruganus* at Birmingham, but only once.

Diurnea fagella—occurs near Birmingham with the anterior wings of the male grey, instead of cream colour, the markings being, however, usually preserved. The rudimentary wings of the female are often deep black.

Cerostoma vittella—anterior wings entirely black. Occurs rarely at Birmingham; I have never taken any form of *C. vittella* at Teignmouth.

Prays Curtisellus—the aberration (*rustica*) occurs both at Birmingham and Teignmouth. Some years ago there was an ash tree in one of the roads of Edgbaston especially haunted by this insect, and intermediate forms between the type and the dark aberration were frequent, with the head yellow, the anterior wings dark grey, and yet the markings of *Curtisellus* plainly to be seen.

Gracilaria syringella—with the fore-wings brownish-fuscous, generally somewhat mottled with darker marks. Occurs occasionally at Birmingham, but is unknown at Teignmouth.

I have taken *Agrotis suffusa* and *Agrotis nigricans* with the anterior wings black at Teignmouth, but both insects are very rare near Birmingham. *Cidaria suffumata* is of the usual type at Birmingham, as at Teignmouth. *Hadena rurea* occurs in both places under the two forms of *alopecurus* and *rurea* proper. Specimens occasionally occur of male *Hibernia defoliaria* at Birmingham with the anterior wings unicolorous, of a reddish-brown hue. Many insects are certainly habitually darker near Birmingham than near Teignmouth, but it would require a long and carefully prepared series from each of the localities to speak of this with certainty, yet it is not going too far to say, that it would not be difficult as a rule to separate specimens from the two localities in some cases, as for example, *Segetia xanthographa*, *Boarmia rhomboidaria*, and *Halia wavaria*.

The only insects in which darker forms occur in the south of Devon (known to me) are *Camptogramma bilineata*, in which an aberration of the female with either one or two black transverse bands is found frequently, and *Bactra pauperana*, which, in the Salt Marshes by the Warren at Dawlish, has often a dark longitudinal band, or is uniformly dark brown, except the anterior costa.

It will be noticed that the only case recorded in this list where complete melanism extends to the inferior wings is in *A. betularia* (which does not completely hide them when in repose), but often the inferior wings are darker than the type.

105, Harborne Road, Edgbaston :

September 11th, 1888.

Lycæna Alexis, Hb.—Referring to Mr. C. G. Barrett's remarks in this Magazine (vol. xxv, p. 83), I may say that this year I have taken a number of fine females exquisitely shot with blue, many being almost as blue as the males, in a field bordering Edlington Wood, near Doncaster. The normal form of the female appeared to be very scarce.—A. E. HALL, Norbury, Sheffield : September, 1888.

NOTES ON THE LIFE-HISTORY OF THE SECOND BROOD OF
PLATYPTILIA GONODACTYLA.

BY J. W. TUTT, F.E.S.

The fact of *Platyptilia gonodactyla* being double-brooded has been known to individual Lepidopterists for some years, but up to the present time it has been unknown how the larvæ of the summer brood fed up. It is a well-known fact that the larvæ of the June brood feed in the capitula of *Tussilago farfara*, but since the plant only blossoms in early spring, it was impossible that the second brood should feed in the same manner. Mr. Gregson once bred a moth (Entom., vi, p. 427) from a larva feeding on the under-side of *T. farfara*, and (Entom., xviii, p. 151) suggested this might be the continental *farfarella*, Zell. I pointed out at the time (Entom., xviii, p. 170) that it was more than probable that this was simply a specimen of the second brood of *gonodactyla*, and that the way it had fed would prove to be the ordinary way of feeding of the autumn brood of *gonodactyla*. This supposition I have fully confirmed during the present summer.

In May my little son collected a large quantity of the flower-heads of *T. farfara*, and I bred a large number of specimens of *gonodactyla* during June. Towards the end of that month it struck me that I could easily find out how the second brood fed up, and potting up a plant of *T. farfara*, I enclosed six pairs of newly emerged *gonodactyla*. During the following week a large number of ova were laid; the larvæ hatched on July 2nd—5th, and changed to pupæ on August 25th—27th.

The following notes may be of use:—

The ova are somewhat ovate in shape, and laid upon the long edge, not on the apex; the colour pale pea-green, and apparently smooth; chiefly laid deeply among the fluff on the under-side of the leaves or on the stem, but some were laid on the muslin or on the flower-pot. (Those that were laid on the muslin had been often pushed through the tiny holes and deposited on the outside.)

First appearance of larvæ on July 2nd and 3rd, when numerous tiny mines were noticed in the under-surface of the leaves. On July 7th, a thorough examination showed a number of small round holes in under epidermis, and mines leading from these; the larvæ in the mines were most inconspicuous, and could only be traced by their black heads.

On July 10th, I found a large number of tiny larvæ—pale green, with black heads, the two following segments with a black plate and a dark dorsal streak—mining under the fluff both of leaves and stems. The larvæ were now conspicuous enough, many wandering about on the outside of the under-surface of the leaves.

As the plant was sickly, I turned out the pot into the open ground, and placed it so that the larvæ could crawl on strong growing plants in the garden. From this time the larvæ lived quite exposed, and entirely under natural conditions.

On July 19th, some of the larvæ had left the mines, and were feeding outside. They were about one quarter of an inch long, and very pale in colour. Those that were feeding outside the mines, and quite exposed, were eating little round holes in the under-surface of leaves, through the epidermis and parenchyma, leaving only the upper epidermis.

On July 30th some larvæ were still mining under the fluff of the under-sides of the leaves, but most of them were now fully exposed. Some larvæ now with quite a dark purplish-brown dorsal line. I did not see the larvæ after this for three weeks.

On August 19th I returned home from Deal, and saw at once that the larvæ had recently been at work, still eating round holes through the lower part of the leaves, but leaving the upper epidermis. The larvæ were now nearly full-fed, and appeared to vary in a much less degree than the spring brood, being, as a whole, much paler; no traces of mining; one pupa spun up in a web on under-side of leaves. This is exactly as many of the early brood pupate.

On August 24th some of the larvæ spun up ready to pupate, in a silken web on under-surface of leaves.

On August 26th several pupæ all spun up in a similar manner, the webs being principally in the fork formed by two veins.

Many of the plants look as if they have been riddled. The growth of the young leaves causes the epidermis, which the larvæ leave, to crack, although the larvæ never appear to eat through the leaf.

On September 4th the first imago appeared, a typical *gonodactyla*.

Westcombe Park, S.E.:

September, 1888.

ON THE VARIATION IN THE EARLY STAGES OF *PLATYPTILIA* *GONODACTYLA* (*TRIGONODACTYLUS*).

BY J. W. TUTT, F.E.S.

During the early part of May my little son collected a large quantity of the flower-heads and stalks of *Tussilago farfara*, which were tenanted by the larvæ of *Platyptilia gonodactyla*. I have never paid particular attention to the description of larvæ, and as the description (Entom., vol. xv, p. 32), written by Mr. South, seemed to agree pretty generally with my ordinary observations, I came to the conclusion that the larvæ were much alike, and did not vary. I was much surprised to find, however, a pale larva on the outside of one of the boxes in which I kept the heads, and was at first puzzled as to what it could be, but I soon came to the conclusion that it was one of my *gonodactyla*. This led me to examine them more closely, and the

result was most interesting. Instead of a constant larva, I found that scarcely any two were alike, and that not only did the ground-colour vary extremely, but that the development of the red dorsal and sub-dorsal lines was very different in different individuals. In some, the suffusion was so complete that the whole of the dorsal area was red; in others, so faint that the larva was almost unicolorous green or whitish, according to the ground-colour; in some specimens, too, the larvæ had decidedly brownish, rather than reddish, stripes, in others grey. The notes I made of the different varieties at the time were as follows:—

(1.) Ground-colour grey, with very dark reddish dorsal and sub-dorsal stripes. In some specimens of this form the colour of the stripes suffuses the whole of the dorsal area, while in others they exist simply as fine lines, often reduced to a series of dots, by the breaking up of the lines in the neighbourhood of the abdominal incisions.

(2.) Ground-colour green, with the reddish dorsal and sub-dorsal stripes offering almost as great differences as in var. 1, both as to depth of colouring, and area of suffusion.

(3.) Ground-colour whitish, with very faint reddish stripes, sometimes only a faint reddish tinge in the dorsal and sub-dorsal areas.

(4.) Ground-colour whitish, with indistinct, grey, narrow, dorsal and sub-dorsal stripes, in fact, almost unicolorous.

These differences were not due to different stages of maturity, as these descriptions were written from larvæ when perfectly full-fed.

I believe it is generally supposed that all the *Pterophorina* simply attach themselves by the anal segment when pupating, and do not spin a web or other protection over them. *Gonodactyla* always does: whether it spins up in the pappus of the flower-head, whether it spins on a leaf, or on the side of a box, a slight web is spun over the larva *always*.

If I was surprised at the result of my observations with regard to the range of variation in the larval stage, I was still more surprised when these larvæ commenced pupating. There seems as much divergence in colour and markings in this stage as in the larval, a very unexpected occurrence, for it is rare that any insect varies a great deal in the pupal stage, and when it does (as in *Papilio Machaon*), it rarely exhibits intermediate forms. The varieties I noted were as follows:—

(1.) Ground-colour pinkish, with dark reddish dorsal and sub-dorsal stripes, with the wing-cases darker and striated all over with fine longitudinal black lines; generally, but not always, with distinct black spiracles.

(2.) Ground-colour grey, with dorsal and sub-dorsal lines, and wing-cases, as in var. 1, but the spiracles always very indistinct.

(3.) Ground-colour bright green, with no stripes, the abdominal incisions slightly paler, the wing-cases of the same green colour, and no longitudinal striæ. The spiracles whitish.

(4.) Ground-colour unicolorous pink, with whitish wing-cases. The spiracles very indistinct.

These were described when the pupa-cases were well set. All the above varieties assume a dark appearance just before emergence.

The imagines first began to appear on June 2nd, and between that date and July 1st, I bred above 120 specimens. There appears to be some difference in the colour of the imagines, and I am inclined to suppose that the larval and pupal variation is continued into the imago state, as some specimens are more distinctly rosy and strongly marked than others; some being distinctly whitish-grey, some quite strongly reddish-ochreous in colour.

From some of the later of these moths I have reared a second brood, and proved that the "fluff-mining larva," which Mr. Gregson considered might prove the continental species *farfarella*, Zell. (Entom., xviii, p. 151), is only, as I then suggested it might be, the second brood of *gonodactyla*.

May I kindly refer those who are interested in this species to Entom., xviii, p. 151; pp. 169—172; pp. 195, 196!

The above notes on variation may throw a side light on the *plagiodactylus* group, the so-called species of which appear principally to differ in the ornamentation of the larva, *i. e.*, either in the depth or quantity of colouring matter and general extent of suffusion.

Westcombe Park, S.E.:

September 4th, 1888.

Chærocampa celerio at Reading.—On the 3rd instant a perfect specimen of *Chærocampa celerio* was brought me alive by Mr. G. Philbrick of this town, who had just taken it in his garden.—W. HOLLAND, Reading: August 17th, 1888.

Protective resemblance in larva of Stauropus fagi.—I picked up a full-fed larva of *Stauropus fagi* on the path in a beech wood the other day. It very closely resembled a curled-up beech leaf like those beside it on the path.—ID.

Occurrence of Argynnis Paphia (var. *valezina*) near Reading.—I have taken two specimens of *Argynnis Paphia* (var. *valezina*) at Hardwick Park, near here, this month. It seems rather later than the type form. It appears to be extending its range, although among the hundreds of *Paphia* on the blackberry blossoms at Odiham Wood, Hants, I never saw a specimen.—ID.

DESCRIPTIONS OF SEVERAL NEW SPECIES OF *LYCENIDÆ*
FROM W. AFRICA.

BY HAMILTON H. DRUCE, F.E.S.

LIPTENA RUBRICA, *sp. n.*

Upper-side.—Allied to *L. Libentina*, Hew., from which it differs in the larger area of dark brown on the wings, and, consequently, smaller area of red, which does not extend beyond the cell in the fore-wings.

Under-side.—As *L. Libentina*, excepting that the area of the fore-wings is dusky brown, with a small yellow spot at the anal angle. It is also a considerably longer-winged insect, in that respect approaching *L. acraea*. Exp., $1\frac{1}{2}$ in.

Hab.: Cameroons, Addah, W. Africa. Mus. Druce.

This species has long been in our collection, and upon receiving another specimen I have ventured to describe it.

PSEUDERESIA HELENA, *sp. n.*

Upper-side.—Primaries and secondaries uniform dull purplish-black; secondaries with a bright red oblong spot about the middle of the wing, commencing at the sub-median nervure, and extending to just beyond the cell.

Under-side.—Dusky brown, covered with irregular light yellow spots; primaries with several small spots along the costa, two spots in the cell, an irregular crescent of spots, commencing at the costa and reaching to about the middle of the inner margin; the two lower spots being a reddish colour; beyond this is a double marginal row, which converges into one larger spot just below the centre of the outer margin; secondaries with three large spots along the costa, three in the cell, and three close to the abdominal margin; beyond these is a regular sub-marginal row of smaller spots, and a marginal row of irregular sized spots.

Head, thorax, and palpi black; legs black, banded with yellow. Exp., $1\frac{3}{10}$ in.

Hab.: Addah, W. Africa. Mus. Druce.

This species is not nearly allied to any described, and can at once be distinguished by the entire absence of markings on the primaries above.

LARINOPODA ALBULA, *sp. n.*

Upper-side.—Primaries and secondaries pure white, primaries with the costal margin evenly and rather broadly bordered with dark brown along about two-thirds of its length, where it runs into the apical patch, which extends along the outer margin and appears abruptly terminated by the last median nervule; secondaries narrowly bordered from just below the apex to the anal angle with dark brown.

Under-side.—Primaries as above, but with a large dusky white patch at the apex; secondaries with a broad dark brown border, commencing just below the apex and extending to the anal angle, where it narrows to about one-fourth and continues to the base. This broad border showing through the wing to the upper-side. There is also a minute bright yellow line along the outer margins of both wings just inside the fringe.

Head and thorax black; legs yellow, with black spots; abdomen greyish.

Exp., $1\frac{1}{2}$ in.

Hab.: Addah, W. Africa.

Mus. Druce.

This species, although somewhat allied to *L. varipes*, Kirby, may be easily distinguished by the entire absence of spots, and by the broad border to the under-side of secondaries.

TERIOMIMA MELISSA, *sp. n.*

Upper-side, ♂.—Primaries and secondaries dark purplish-brown, duller towards the margins.

Under-side.—Dull greyish-brown, slightly suffused with reddish scales, and an indication of a double marginal row of spots.

Palpi yellowish; legs black, banded with yellow.

Exp., $\frac{2}{10}$ in.

Hab.: Addah, W. Africa.

Mus. Druce.

This species, although closely allied to *T. dispar*, Kirby, may be distinguished by the entire absence of the reddish band across the middle of the under-side of secondaries. When held in some lights, the abdomen of this species appears clothed with emerald-green hairs.

TINGRA TRIPUNCTATA, *sp. n.*

Upper-side.—Allied to *T. amenaida*, Hew. (Exot. Butt., vol. v, Pent. and Lipt., ii, f. 4), from which it differs in having only two spots on the primaries, *i. e.*, one in the centre, the other at the end, of the cell, whilst there is only one spot on the secondaries, which is placed at the end of the cell.

Exp., $1\frac{3}{10}$ in.

Hab.: Addah, W. Africa.

Mus. Druce.

London: August, 1888.

ON THE HABITS OF *CATEREMNA TEREBRELLA*, Zk.

BY CHAS. G. BARRETT, F.E.S.

Through the kindness of Lord Walsingham I have had an opportunity of investigating the habits of his most interesting recent addition to the British fauna, *Cateremna (Euzophera) terebrella*, Zk. Early in August, 1887, he supplied me with distorted green cones of spruce fir, *Pinus abies*, found growing on the trees, and also with one or two old and fallen cones which had a suspicious appearance. From one of the latter I reared a specimen of the moth at the end of the same month. The green cones were kept as much as possible in a natural state for nearly a year, and on July 23rd of the present year a specimen of *terebrella* emerged, followed, in the course of a fortnight, by two more. In the meantime, acting on instructions kindly furnished by his lordship

and Mr. Hartley Durrant, I searched among fallen cones of spruce fir in other localities nearer to Lynn, examining, probably, thousands of cones and bringing great numbers home. From these I reared half a dozen more *terebrella* at the end of July and beginning of August. These varied greatly in size, two being very large specimens.

From the fact that the green cones were to be found *already stunted and distorted*, from the action of the contained larvæ, *early in August*, when the moths were doubtless on the wing and their eggs hardly laid, it is evident that the larva must feed for the greater part of *two years*. This is confirmed by Mr. Durrant's observations. He tells me that he is tolerably certain that the larva is gregarious when young—that is to say, that the moth deposits several eggs upon the same cone—and that he has found cones bearing evident marks of having been inhabited by a number of young larvæ. It seems probable, therefore, that they would leave this original cone in the spring and find their way into the new cones when very young, and usually entering separate cones. Yet I found one instance in which two had pupated in one cone and had left their pupa skins *in situ*. The larva eats through the woody sheaths or scales of the cone devouring the seeds, and thus checks the growth of the cone and causes it to look ragged and deformed. The growth of the larva must be extremely slow, it remains in the cone all the winter, is in no degree disturbed by its fall to the ground, and seems to approve of the saturated condition into which it gets upon the ground, for, having eaten all the seeds, or as many as it requires, it eats the woody substance of the scales, hollowing out a large chamber in the cone, which chamber it, however, keeps well filled with excrement, and here assumes the pupa state in July, making little or no cocoon, and emerging as a moth in about a fortnight.

The larva when full-grown is rather sluggish, plump, and shining, with segments deeply divided and rather swollen. Colour, dull white, with the whole dorsal region strongly shaded by the dark grey internal dorsal vessel. Spots small, black; head and dorsal plate pale chestnut, the latter dotted behind with black; anal plate black, divided transversely. The pupa is light brown, very slender and small in proportion to the size of the moth.

Zincken has described the larva as "yellowish-white, with six rows of small black raised dots. Head nut-brown, dorsal plate somewhat paler, anal plate the same. Found at the end of summer in the small slight barren cones of *Pinus abies* which contain no ripe seeds. Pupating in the *earth*. Occasionally the larva passes the winter in the cone. Imago in *June* and *July*. In mountainous regions."

The colour of the plates probably changes with growth, but Zincken's account of the habits of the creature indicates a far more rapid growth, and earlier emergence, in its favourite districts.

The moth is pretty and quite unlike any other British species. Its fore-wings are blackish, greyer towards the dorsal margin, and having a reddish gloss in certain lights. The first and second lines are white, and between them is a large irregular and ill-defined white blotch which sometimes assumes almost the form of a fascia. In this white blotch are two black dots placed perpendicularly to the costal margin. The hind-margin is dotted with black, with shining dark grey cilia. Hind-wings pale grey, with a double dark line at the base of the cilia.

Whether this species is ever likely to become common with us is very doubtful. At present it is certainly very rare, yet widely distributed in Norfolk, and I see no reason to suppose that it is recently introduced. Nothing could, from its habits, be more easily overlooked. I find that but one specimen was captured at Merton this year, and only two reared.

Among my cones brought from Merton, I found in the spring, one in which a larva was feeding in a different manner—extruding plenty of excrement through a round hole in the side of the cone. To this was doubtless due the quite unexpected appearance of a fine specimen of the rare and handsome *Dioryctria splendidella*, H.-S., in the middle of June. It was not previously recorded in the eastern counties.

A specimen of *Coccyx Ochsenheimeriana* also emerged, but nothing had been observed of its larva or mode of feeding.

King's Lynn, Norfolk :
September, 1888.

Sphinx ligustri in the North Sea.—Mr. J. Bowen, the Mate of the *Leman* and *Ower* Light Vessel, moored in the North Sea, about 48 miles E. N. E. of Cromer, reports, under date of July 30th, 9 a.m., wind E. S. E. c. m. (4), "three privet hawk-moths (*Sphinx ligustri*) came to the lantern;" one of these was taken, and subsequently sent to me for identification, the others (Mr. Bowen says) left the ship and went with the wind.—JOHN CORDEAUX, Gt. Cotes, Ulceby: August 28th, 1888.

Note on Deilephila galii.—The larvæ of this species were very plentiful this season at Deal. I found fifty one morning in about a couple of hours on a bank not more than a hundred yards long. They do not conceal themselves during the daytime like those of *C. porcellus*, which were also very common.—E. G. MEEK, 56, Brompton Road, S.W.: September 6th, 1888.

Deilephila galii at Deal.—From August 11th to September 1st last, I spent at Deal, the first fortnight in company with Mr. G. C. Dennis, of York; and during the three weeks the *Lepidoptera*, *Neuroptera*, and *Orthoptera* received a considerable share of attention. Mr. J. W. Tutt was also there during our first week, and to his kindness in showing us all the localities for the various species of *Lepidoptera* we were greatly indebted. But it was not until August 29th, when Mr. W. H. Tugwell came down with the intelligence that a number of *Deilephila galii* had been taken in the neighbourhood during July, and that he intended to search for the larvæ, that it had occurred to me it might be worth while to look for them. During the afternoon of next day we made a search, when I had the satisfaction of finding four larvæ of *galii*, though on that occasion only those of *Cherocampa porcellus* and *Macroglossa stellatarum* fell to my friend's lot. Next day, the 31st, we made a closer search, and before evening had taken between us nineteen more *galii* larvæ, nine of which occurred to myself, and ten to Mr. Tugwell. I was very sorry to have to leave Deal early next morning, but Mr. Tugwell intended to remain for some time, and he no doubt will have a satisfactory "reckoning" with *galii*!

Other Lepidopterists were also at Deal, and since my return home I have learnt that fully 170 larvæ were taken among us during my stay. The larvæ varied very much in size and appearance, some being apparently full-fed, others quite small. They seemed equally at home on both the white and yellow bedstraws, and were almost invariably found quite exposed on the top of the (usually) more isolated plants. My thirteen larvæ are so far doing well, and I hope next summer to breed from them a nice series of this beautiful moth.

The ordinary Lepidopterous fauna of Deal is so well known that nothing need be added about it; beyond allusion to the vast hordes of *Plusia gamma* which occurred, and anything approaching which, as seen in St. Margaret's Bay, I had never before experienced: they were in thousands, and on disturbing the flowers at dusk, they flew up, as Mr. Dennis remarked, "like flies from a piece of meat;" their larvæ appeared also to be still feeding on everything, so that they are likely to be on the wing for some time yet.

Vanessa cardui was just getting out when we left, but we did not see indications of the larvæ having been as plentiful as the abundance of the hibernated spring specimens of the butterfly had led us to anticipate.

A few notes on the *Neuroptera* and *Orthoptera* I will reserve for a future number.—GEO. T. PORRITT, Huddersfield: September 6th, 1888.

Deilephila galii larvæ on the South-East coast of Kent.—The imagines of this beautiful and generally rare species in this country have this year been reported from many of our English counties, at Co. Dublin, Ireland, and from Dundee, Scotland, so that I hoped the larvæ might probably be found in the autumn on some of its old haunts, viz., Deal sandhills, where, some thirty years since, the late Dr. Boswell (John T. Boswell Syme) found them pretty freely. I have just returned from Deal, where I spent three weeks, and have given a lot of time to the search for this larva. My hunting extended from St. Margaret's Bay on the West, to Pegwell Bay on the North, a coast line of some 22 miles. *Deilephila galii* larvæ were found over the whole area, comprising as well inland four or five miles from the sea. Given

a suitable spot, and the food-plant growing, I rarely failed to find the larva. Evidently, it preferred *Galium verum*, although a few were taken on *G. mollugo*. They were wonderfully variable, two of them absolutely black, the yellow spots being absent, also several varieties not figured in Buckler's larvæ. When full-fed they are very fond of basking in the sun, on bare patches of sand, when the yellow-drab ground-colour of the larvæ harmonized well with the colour of the sand; and after feeding and basking, they bury themselves in the warm earth, possibly for protection, as they do not pupate under ground. The year 1888 will doubtless be known as the great *galii* year. It is truly remarkable, and a curious problem too, as to what causes may have contributed to this wonderful influx of an insect like *galii*, usually so rare in England.

During my trip, I met with the usual autumn *Lepidoptera*; of *Colias Edusa* a few only were seen, and no rarity was captured.

The larvæ of *Chærocampa porcellus* and *elpenor* were fairly common, whilst *Macroglossa stellatarum* were comparatively rare.—W. H. TUGWELL, 6, Lewisham Road, S.E.: September 20th, 1888.

Vanessa Antiopa in Kent.—On August 22nd I received a letter from my friend, Mr. J. Wood, of Chatham, written the day previous, stating, "To our great surprise this morning we saw a Camberwell Beauty in the garden feeding on an over-ripe gooseberry which had fallen from the bush. We watched it for some time, it looked so beautiful; it flew up and actually settled on me, and then on my sister." Upon receiving this news, and knowing the habit the *Fanessidæ* have of returning day after day to sweets, I arrived at my friend's house about mid-day, and was glad to hear it had again been feeding upon the gooseberry that morning, and I had the fortune to secure it while settled on a gravel walk. It is a fine specimen, $3\frac{3}{16}$ inches in expanse, and very richly coloured, the margins are of a straw-yellow colour; with the exception of the margins being slightly chipped, it apparently was freshly emerged.—F. W. ФРОПАНК, Balham, S.W.: August, 1888.

Obituary.

Philip Henry Gosse, F.R.S.—This well-known naturalist died at St. Mary-church, Torquay, on the 23rd of August, in the 79th year of his age. Although the majority of his scientific works were on Marine Zoology, yet Entomology seems always to have had attractions for him. In his early life he collected insects in Newfoundland, Canada, the United States, and Jamaica, and, after his return to England, he published notes of his captures and discoveries in the "Entomologist," under the title of "The Canadian Naturalist," the "Zoologist," and the "Annals and Magazine of Natural History." When settled in England, he occupied himself chiefly with his marine pursuits, but later on in his life he again took up Entomology specially, and in 1883 contributed an important paper to the "Transactions of the Linnean Society," 2nd Ser. Zool., vol. ii, pt. 6, "On the clasping organs ancillary to generation in certain groups of the Lepidoptera." This treats of these organs in *Ornithoptera* and *Papilio*, and is illustrated by several plates of well executed, enlarged figures of the armature of many of the species. All Entomologists must be glad to see the tendency among Lepidopterists of late years to place special value on structural characters, and to recognise this work of Mr. Gosse as a valuable

contribution to that view of the subject. In our own Magazine, Vol. xviii, 1882, p. 276, Mr. Gosse's capture of *Trioza crithmi*, F. Löw, is recorded by the late J. Scott (whose death we record in this number), as a species new to our British list; and in Vol. xix, p. 65, is given a vivid description from Mr. Gosse of his finding the creature in all its stages on samphire at Anstey's Cove, Torquay. Mr. Scott had, in the April number, Vol. xviii, p. 263, asked for information as to where samphire grew, and suggested that there *T. crithmi* would probably occur, and in the very next number was able to announce that through Mr. Gosse's exertions he was in possession of *T. crithmi* in all its stages. It is a pleasure to record this incident, as it connects the names of the two naturalists whose obituaries appear simultaneously in our current pages.

Mr. Gosse was elected a Fellow of the Royal Society in 1856, and joined the Entomological Society of London in 1879. His diction was pleasing and alluring, and his writings must have had a potent and wide-spread influence in inciting and fostering an observant love of Nature.

John Scott died August 30th last, aged nearly 65 years, he having been born at Morpeth, on September 21st, 1823. He first came into notice as an Entomologist by a note in the "Zoologist," vii, 2633 (1849), on the "Curious habitat of *Tinea ustella*" (a coal mine near Glasgow). In subsequent volumes of the same journal are notes by him on *Lepidoptera*. To the successive volumes of the "Entomologist's Weekly Intelligencer" (1856—61) he was a frequent contributor, chiefly about *Micro-Lepidoptera*, of the economy of which he was a close observer and discoverer. To the "Entomologist's Annual" for 1856, he contributed a paper on *Lepidoptera*, entitled, "On the results of a residence at Fochabers;" in the volume for 1862, he had a chapter on *Hemiptera*, with a description and figure of a very rare species, *Metatropis rufescens*, H.-S.; in the volume for 1863 he gave a paper on the *Hemiptera* detected in Britain in 1862, with descriptions and figures of two new species; in the volume for 1864, he gave an enumeration of the additional *Hemiptera* found in Britain during 1863, with descriptions and figures of two new species; and in the volume for 1866, two additional species were figured, but the descriptions thereof, omitted for want of room, appeared, with other species, in the Ent. Mo. Mag., ii, pp. 217 and 272, and iii, 213 (1866).

He was joint-author of the "British Hemiptera," published by the Ray Society in 1865, this being the first descriptive enumeration of these insects: of this volume his share was the *Capsina*. He was also joint-author of the "Catalogue of British Hemiptera," published by the Entomological Society of London in 1876.

He contributed to the "Transactions of the Entomological Society," Ser. 2, ii, 19 (1854), a description and figure of a new species of *Lithocolletis* (*L. irradiella*); to the same series, v, 408 (1861), descriptions of five new species of *Coleophora*, of which four were figured; to the volume for 1876, a "Monograph (with two plates from his own drawings) of the British species of *Psyllidæ*;" to the volume for 1880, a paper "On a collection of *Hemiptera* from Japan," supplementary to his memoir in the "Ann. and Mag. of Nat. Hist." (1874); and to the volume for 1882, "Descriptions of new exotic *Psyllidæ*," with two plates from his own drawings.

The "Stettiner Entomologische Zeitung," xxxi, 98 (1870), contains descriptions by him of five new species of exotic *Hemiptera*.

In the "Annals and Magazine of Natural History," Ser. 4, vol. xiv (1874), he published a paper "On a collection of *Hemiptera-Heteroptera* from Japan: descriptions of various new genera and species."

In the early volumes of this Magazine, Scott appears as the joint-author of descriptions of *Hemiptera* added to the British fauna; and in vol. v, of a "Memoir on the *Hemiptera* of Palestine." In vols. viii and xiii, he gave descriptions of new genera and species of *Hemiptera* from Corsica. In vol. vii he commenced, and in the succeeding volumes up to xix continued, a "Revision of the British *Homoptera*," which, with few exceptions, included all the known species. In the same volumes are also various notes, inclusive of descriptions of foreign species of *Hemiptera*.

Scott was an indefatigable collector, not only of *Lepidoptera* and *Hemiptera*, but also of *Coleoptera*, of which he formed a good collection. His insects were all disposed of before his death, the most typical specimens of his *Hemiptera* having been acquired by the British Museum.

Of the early life of Scott we are not informed, but there is good reason to believe that he was very young when he was thrown, or went, on his own resources, and that his career was then erratic. In some way he came to be employed as a civil engineer, as such he lived in Glasgow in 1849; he afterwards removed to Stockton-on-Tees, and after some years' residence there, came to London in 1859, as a member of a firm of metal brokers. This business was broken up by the outbreak of the American Civil War. He was then for a few years the Secretary to a Marine Insurance Society, which became absorbed into another Society, and he had to seek other employment. He was then intermittently engaged in various ways: among others, he spent a year or two in Spain, making surveys for a railway in connection with the lead mines at Linares, but the railway was not made. In 1882, and afterwards, he was engaged in engineering work at Plymouth, and then at Lee-on-the-Solent; at the latter place, about 18 months ago, he was attacked by severe epilepsy, which recurred several times, attended by partial paralysis; aberration of mind ensuing, he was taken to an asylum, became imbecile and unconscious, and death finally released him.

"Pallida Mors æquo pulsat pede pauperum tabernas,
Regumque turres."

Being to a great extent a self-taught man, Scott was remarkable for his acquirements. He had qualified himself educationally to be a civil engineer. He was an accurate drawer of insects, even microscopical details he drew with the greatest nicety, without the aid of a camera lucida. He had a good knowledge of music, and the violin quartettes of classical writers, led by him at his house at Lee, were real treats. He had a wide knowledge of English literature. Yet all these availed him little in the conduct of life, for, although when in the humour, he was a genial companion, and in his time had done many good and generous acts to those requiring aid, he had a most impetuous disposition, and a vehement, unconciliating temper, of which no one was better aware or regretted more than himself. Moreover, like Yorick, he was "a fellow of infinite jest," but being oblivious at the moment that

"A jest's prosperity lies in the ear
Of him that hears it, never in the tongue
Of him that utters it,"

the acerbity of his wit and repartee too often wounded those to whom they were

addressed. Thus, from one cause or another, friends were alienated, and many who might have been on friendly terms with him, and have done him service when he sorely required it, held aloof. "Alas, poor Yorick!" Requiescat!

His wife, two sons and two daughters, survive him.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY :
August 23rd, 1888.—T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Mr. H. A. Cruttwell, of Asaba, River Niger, West Coast of Africa, was elected a Member.

Mr. J. T. Williams exhibited nine specimens of *Deilephila galii*, Schiff., taken by him at St. Margaret's Bay, and mentioned that Mr. Felix Oswald had taken eight specimens in the same district. Mr. Wellman, bred examples of *Heliaca tenebrata*, Scop., *Eupithecia togata*, Hb., *Emmelesia unifasciata*, Haw., *Rodophæa formosa*, Haw., *R. suavella*, Zinck., *R. advenella*, Zinck., *Sesia ichneumoniformis*, Hb., among which were three specimens having yellow bands; he also showed a melanic specimen of *Venusia cambrica*, Curt., from Sheffield. Mr. South, many species and varieties taken in Sussex, among which was a variety of *Arctia villica*, L., and an example of a *Plusia*, which might possibly be a variety of *Plusia gamma*, L. Mr. Joy, *Coremia designata*, Hufn. Mr. Helps, *Acontia luctuosa*, Esp. Mr. T. D. A. Cockerell, *Trichodes ornatus*, Say, *Chrysis pacifica*, Say, and *Cantharis Nuttalli*, Say, from Colorado, and notes were read relative to his exhibit.

The Secretary also read the following communications from a note on the genus *Euchloë*, and a short paper, entitled, "Can insects distinguish between red and yellow?" in which he asked the Members to assist him with information as to whether yellow insects showed a fondness or otherwise for pink flowers, and whether the insects seemed aware of the difference between red and yellow.

September 13th, 1888.—J. T. CARRINGTON, Esq., F.L.S., Vice-President, in the Chair.

Mr. J. H. Keys, of Plymouth, was elected a Member.

Mr. H. A. Auld exhibited a large number of *Dicycla oo*, L., taken at sugar on August 10th last near Hayes. Mr. Bouttell, a fine variety of *Melanippe sociata*, Bork, also many other species. Mr. Turner, a melanic specimen of *Boarmia gemmaria*, Brahm, v. *perfumaria*, Newm., taken near Ashdown Forest. Mr. Stringer, species of *Lepidoptera* from Shenley, and remarked on the unusual abundance of *Ino statices*, L., and *Zygæna filipendulæ*, L. Mr. Croker, imagines and preserved larvæ of *Smerinthus populi*, L., and *Panolis piniperda*, Panz. Mr. Elisha, fine bred series of the following *Tortrices*: *Argyrolepis æneana*, Hb., *A. zephyrana*, Tr., *Eupæcilia atricapitana*, St., *E. amandana*, H.-S., *Retinia turionana*, Hb., *Catoptria juliana*, Curt., *Phoxopteryx derasana*, Hb., *Ephippiphora trigeminana*, St., and *Carpocapsa pomonella*, Schiff., the last named bred from the berries of the white beam tree; also the following *Tineæ*: *Nematois fasciellus*, Fb., *Cerostoma horridella*, Tr., *C. alpella*, Schiff., *Ecophora unitella*, Hb., *Coleophora therinella*, Tgst., and *Gelechia semidecandrella*, Threlf., the last named bred from *Cerastium tetrandrum*. Mr. Wellman, bred examples of *Noctua sobrina*, Gn., *Plusia interrogationis*, L., both from Perth, *Dianthæcia irregularis*, Hufn., from Cambridge, &c. Mr. South, short series of *Lycæna Icarus*, Rott., from County Durham, which he said might be

regarded as a fair sample of *L. Icarus* occurring at Bishop Auckland and Castle Eden, one specimen (a male) having distinct black patches in the fringes, several of the females were remarkable for having all the under-surface markings of the primaries reproduced on the upper surface; he also showed fourteen specimens of the male of *L. Icarus*, having traces of black spots on the hind-margins of the inferior wings, picked from between sixty or seventy examples.

Mr. Weir read an extract from a letter from Mr. Merrifield, in which he stated that in carrying out his experiments with *Selenia tetralunaria* for Mr. Galton, he had obtained some interesting results in colour, and to prosecute these he would be glad of ova and larvæ of the species in question from Scotland, Ireland, Wales, the North of England, or any continental country.

Mr. Tutt mentioned that the larvæ of *Deilephila galii*, Schiff., had been occurring very freely at Deal.

An interesting discussion took place on the probable influence of humidity in causing variation among *Lepidoptera*.—H. W. BARKER, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON: Sept. 5th, 1888.—Dr. D. SHARP, F.L.S., President, in the Chair.

Mr. M. Stanger Higgs, of St. Leonard's, Gloucester, was elected a Fellow of the Society.

Dr. Sharp mentioned that he had received, through Prof. Newton, a collection of *Coleoptera* from St. Kilda, consisting of *Carabus catenulatus* (1), *Nebria brevicollis* (12), *N. Gyllenhalii* (3), *Calathus cisteloides* (20), *Pristonychus terricola* (1), *Pterostichus nigrata* (71), *Pt. niger* (31), *Amara aulica* (4), *Ocyrops olens* (1). The species being nearly all large *Geodephaga*, he thought probably that many other *Coleoptera* inhabited the island. He remarked that these specimens showed no signs of depauperation, but were scarcely distinguishable from ordinary English specimens.

Mr. South exhibited a melanic *Aplecta nebulosa* from Rotherham, bred with five others of ordinary form, and an albino of the same species from Devonshire; a very curious dark variety of *Plusia gamma*; two dark vars. of *Eubolia limitata* from Durham; *Dicrorhampha consortana* from North Devon.

Mr. Champion exhibited *Harpalus cupreus*, *Leptusa testacea*, and *Cathormiocerus maritimus* from Sandown, Isle of Wight.

Mr. Elisha exhibited the following *Micro-Lepidoptera*:—*æneana*, *atricapitana*, *turionana*, *juliana*, *derasana*, *capreana*, *pomonana*, off *Sorbus aucuparia*; *sodaliana*, *zephyrana*, *trigeminana*; also *Schiffermullerella*, *horridella*, *alpella*, *fuscoarella*, *therinella*, and *semidecandrella*, on *Cerastium tetrandum*.

Mr. Jacoby exhibited three boxes of *Coleoptera*, collected partly by Mr. Fruhstorffer, containing some rare *Cetoniidæ*, *Paussidæ*, &c.

Mr. E. Saunders exhibited *Amblytylus delicatus*, Perr., a new British bug, taken at Woking.

Mr. Jacoby mentioned that he had taken the larva of *Vanessa cardui* on a narrow white-leaved plant in his garden.

Mr. Enock mentioned that out of a batch of two males and six females of the Hessian Fly kept together, all six females had laid fertile eggs, so that each male must have impregnated more than one female.

OBSERVATIONS ON *COCCIDÆ* (No. 2).

BY ALBERT C. F. MORGAN, F.L.S.

In my last paper (p. 42 *ante*) I offered some introductory remarks upon the different genera of *Diaspina*, and upon the formations of the scales, both male and female, on which those genera depend. I did not mention several genera which appear to have been established upon other grounds by different authors, but it may be well now to glance through these. The genus *Leucaspis* (including only two species) has all the external characters, as regards scale and exuviae, of *Mytilaspis*, and this is confirmed by Signoret (Ess. s. l. Coch., p. 144). It is only after microscopical examination that differences are found in the arrangement of certain glandular organs and caudal appendages in the female; but whilst these afford excellent characters for specific determination, it seems scarcely desirable that they should subserve generic purposes, as in that case, the uniformity of the rule on which the genera of this sub-family (*Diaspina*) has been established, becomes imperfect. The same remark applies to the genus *Poliaspis*, established by Maskell (Acet. N. Z. Cocc., p. 56), and which includes only one species. Of this genus, Comstock (Ag. U. S., 2nd Rep., p. 126) writes: "I am far from feeling sure that the genus will prove to be a natural one." The genus *Targionia*, established by Signoret, included only one species, and was abandoned by Comstock (*op. cit.*, p. 82) because it was founded upon that species showing a ventral scale; but this is not uncommon with many species of *Aspidioti*. The genus *Asterodiaspis*, including again only one species, was also abandoned by Prof. Comstock, who says (*l. c.*, p. 30): "A more careful study of this species has convinced me that it does not belong to the *Diaspinæ*." The genus *Aonidia* was established by Targioni-Tozzetti, to include the one species which he considered to be identical with the *Coccus aonidum* of Linnæus. Signoret mentions the genus and the species, but re-names the latter *Aonidia lauri*; but it seems to me that this genus can hardly be maintained, for the characteristics of it, as mentioned by Dr. Signoret (*op. cit.*, p. 147) are common to many other genera. He says (*l. c.*) "l'insecte à l'état parfait serait donc plus petit que primitivement, ce qui est un fait extraordinaire." But I have found this a very common feature of many of the *Diaspina*. The second skin is also mentioned by Signoret as being only separable from the first after maceration in water; but I think it will be found that this is necessary in many instances.

I think I have now cited all the genera of *Diaspina* which have been established by different authors, and, as far as those which I have

mentioned are concerned, I think it will be convenient, at all events for the present, to consider them insufficiently established.

I propose now merely to refer to Plate II annexed, which shows the insects removed from their scales, many of which latter were shown on Plate I (*ante*). All the figures on Plate II are magnified fifty times, in order to show the relative proportions of the insects, and are intended to represent types of the *Diaspina*. They must not be relied upon when *specific* determination is required, as the magnification is too small to allow the engraver to produce with precision minute specific differences, which will be shown on a larger scale in future drawings.

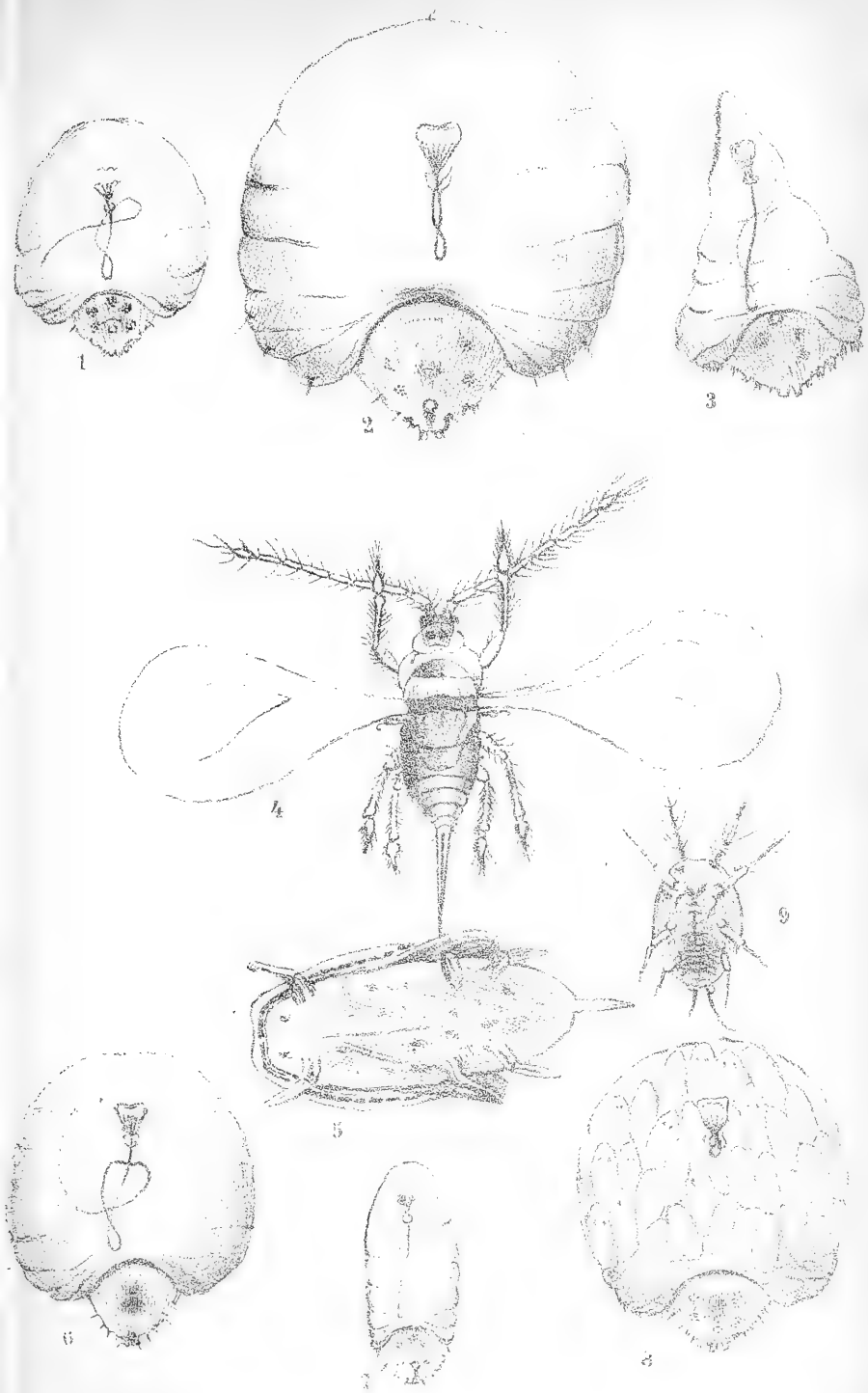
With the exception of figs. 4, 5, & 9, all represent adult females. Fig. 1 is *Diaspis ostreæformis*, and fig. 2 is *Aspidiotus ostreæformis*. The difference in size between these two insects should be observed, although *A. ostreæformis* is not always quite so large as shown in the figure, which represents an old adult form. These two species (which belong to different genera) were considered as the same species, until Mr. Douglas (Ent. Mo. Mag., xxiii, pp. 239—241) drew attention to their distinction. His opinion was confirmed by Professor Comstock, and subsequently my own observations still further proved the accuracy of Mr. Douglas' opinion. As this is not the moment for entering more fully into that question, I may perhaps merely mention that the difference of the genera was at once established by the difference in the scale of the male, which is an incidental circumstance in favour of maintaining the character of the scales as the line on which to establish the genera. Fig. 3 represents *Mytilaspis pomorum*, and this it will be observed is of a different shape to the *Diaspis* and *Aspidiotus*, such as one might expect on referring to its scale (see Plate I, fig. 4). This insect is very much smaller in its adult form than in its previous stage, and the second exuvæ completely covers the adult form, leaving room for the young to congregate under the shelter of the rejected skin, at the posterior end of their parent, until they move out to find a suitable spot on which to fix themselves by means of their rostral setæ, there to remain during the remainder of their lives. Fig. 6 represents *Aspidiotus rapax*, Comstock, found in abundance on camellias in the open air in Portugal, and I presume in other parts of Southern Europe. I am inclined to think that this will prove to be synonymous with *A. camelliæ*, Signoret, notwithstanding my previous observations on this question (Ent. Mo. Mag., xxiv, pp. 79—82). Fig. 7 is *Mytilaspis pandani*, which it will be seen is similar in shape to *M. pomorum*, although a smaller and more delicately formed insect.

Fig. 8 is *Aspidiotus nerii*, the most common of all species in Europe, North America, and New Zealand. It is found in abundance on the oleander and other trees. The figure shows the female crowded with young, and the dots on the latter (which appear like eyes in the figure) are the rostral setæ, rolled up in the form of a coil on each side of the mouth. This is characteristic of the larvæ of the *Diaspina*, and we may presume that the setæ are not uncoiled until required for extracting the juices of the food-plant, after the insect has once made a settlement. Fig. 9 shows the larvæ of *A. rapax*, Comstock, and it will be observed that it is furnished with two caudal hairs, which is the case with all the larvæ of *Diaspina*. When these first emerge from the parent, they are enclosed in a pellicle, which, however, is soon broken by the insect inside. The insect may be observed under the microscope to push through head first. Fig. 5 represents the pupa state of the male of *Aspidiotus zonatus*; the antennæ, legs and wings will be observed all enclosed in their respective separate casing, and this stage of the male is characterized by the formation of what appear to be granulated protoplasmic bodies, which are also noticeable in the perfect imago. The perfect winged male of this species is shown in fig. 4, and is a type of the males of all the *Diaspina*. Indeed, I have failed to find any reliable differences in the males of the different genera, which seem remarkably similar to one another. The characteristic inferior eyes of the male are shown in the figure, although, as it is a dorsal view, these would not in fact be seen. The other characteristic features of the male—the wings with one branched nervure, the halteres with annexed hooked bristle, the exerted penis enclosed in sheath, the pubescent 8-jointed antennæ, and the one-clawed tarsus—will not failed to be noticed; and lastly, the remarkably degenerated form of the apodous female presents a striking contrast to the elaborated form of the perfect male, which, however, has lost its mouth and promusci, whilst the abdomen has become atrophied.

EXPLANATION OF PLATE II.

- Fig. 1.—*Diaspis ostreæformis*, ♀.
 Fig. 2.—*Aspidiotus ostreæformis*, ♀.
 Fig. 3.—*Mytilaspis pomorum*, ♀.
 Fig. 4.—*Aspidiotus zonatus*, ♂.
 Fig. 5.— ditto, ♂ pupa.
 Fig. 6.—*Aspidiotus rapax*, Comstock (? = *A. camellia*, Sign.), ♀.
 Fig. 7.—*Mytilaspis pandani*, Comstock (? = *M. buxi*, Bouché), ♀.
 Fig. 8.—*Aspidiotus nerii*, ♀.
 Fig. 9.—*Aspidiotus rapax*, larva.

N.B.—The above figures are all magnified fifty times.



CATHORMIOCERUS SOCIUS AND *MARITIMUS*.—AN ENTOMOLOGICAL COMEDY OF ERRORS.

BY G. C. CHAMPION, F.E.S., AND D. SHARP, M.B., F.L.S.

In 1843, Boheman described (Schönherr, Curculionidæ, vii, I, p. 121) a new species of *Cathormiocerus* from a specimen sent to him by Walton, giving as its country, "Anglia, Mus. Dom. Walton."

In 1847, Walton stated (Ann. and Mag. Nat. Hist., xix, p. 317) that this specimen was the only one (of the species) he had seen, adding, "I think it came into my possession with the collection of the late Mr. Millard, of Bristol; of its history and locality I am equally ignorant. * * *"

In 1848, Walton's paper was translated into German in the Stett. Zeit. (ix, p. 346), but this paragraph was not happily rendered, making it appear that Walton was doubtful whether the example was a British one.

Crotch and Rye omitted the species from their Catalogues of British *Coleoptera*, published between the years 1860 and 1868.

In 1868, Seidlitz obtained the loan from the Stockholm Museum of Schönherr's typical example, and on examining it found that it agreed exactly with examples found by von Kiesenwetter, near the snow, at a great elevation, in the Sierra Nevada, in the south of Spain, and referring to the version of Walton's statement about its origin, given in the Stett. Zeit., concluded (Die Otiorhynchiden s. str., p. 134) that this type was not a British example at all, and insisted that Spain was the only locality known for the species: at the same time he distinguished the sexes of the species as very different, on account of the scape of the antennæ being differently formed in them.

In 1868, Rye recorded (Ent. Mo. Mag., v, p. 68) the occurrence in the Isle of Wight of an example of *C. socius*, Sch. and Seid., and stated that the late Mr. Waterhouse also obtained an example of the species from Walton's collection.

In 1869, Rye repeated his record (Entom. Ann., 1869, p. 43, pl. f. 6), with some alterations and additions, and a figure of the species was given.

In 1870, Rye again alluded (Ent. Mo. Mag., vii, p. 149) to this insect, and announced the existence of a second British species of the genus, detected by Moncreaff, at Portsea.

In 1874, having communicated this insect to Seidlitz, and obtained his opinion that it was new, Rye described (Ent. Mo. Mag., x, p. 176) this second British species under the name of *C. maritimus*, and these

two names have been duly recorded in the Catalogues of British *Coleoptera* that have appeared since that time.

In 1882, Bedel published (*Faune Col. Seine*, vi, p. 40) a brief description of a species he calls *C. socius*, as occurring in France, but without localities or particulars.

In 1885, Uhagon described some new species of *Cathormiocerus*, accompanied by three pages of remarks on *C. socius* (*Ann. Soc. Esp.*, xiv, p. —?, 13 of sep.). He states that Srs. C. Brisout de Barneville and Bedel have informed him that the French *C. socius* described by Bedel is *C. maritimus*, Rye, and by a series of logical propositions, arrives at the conclusion that *C. socius*, Bedel, and *C. maritimus*, Rye, are one species, and suggests that *C. socius*, Schön., as regards its Spanish examples, is probably a distinct species; also on comparing a French *C. socius*, Bedel, with a Spanish example (from the Guadarrama, not from the Sierra Nevada), he finds some distinctions between them which he duly records.

In 1886, Bedel gives (*Faune Col. Seine*, vi, p. 234) French localities for his *T. socius* (the genus being merged in *Trachyphlæus*), and adds that, according to Uhagon, the specimens from Normandy and Brittany are *C. maritimus*, Rye, "and which appears to be only a variety of *socius*."

In 1885, Stierlin (*Mitt. Schw. Ent. Ges.*, vii, p. 142), in the *Bestimmungs-Tabellen europäischer Rüsselkäfer*, gives *socius* and *maritimus* as distinct species, assigning to the former only Spain as its country, and to the latter France and England.

It will be seen from the above that authors have been in strange disagreement about these insects, due partly to the supposition that a species inhabiting the Sierra Nevada and England had something wrong about it, partly to the paucity of specimens which did not permit them actually to test this suspicion by observation, but also largely to the fact that they failed to make themselves acquainted with what had been written by others.

We are now in a position to speak with certainty on most of the dubious points, as one of us has secured a large series of examples in the Isle of Wight, and the other has taken the species both in the Isle of Wight and in the Sierra Nevada. Sharp being in possession of a small series (7) of examples captured by him on the 18th July, 1879, at the margins of the snow-fields, at a great elevation, in the Sierra Nevada, we have compared these with the Isle of Wight examples, and find them quite similar. This conclusion does not appear open to any doubt for this species, *C. socius*, is so distinct from

all others by the peculiar construction of the antennæ, that it is one of those species that can be most easily recognised. Thus, improbable as it may seem, it is undoubted that the specimens inhabiting the snow-fields of the Sierra Nevada, and a sandy spot on the shores of the Isle of Wight, are one and the same species.

The series obtained from these two localities we have also compared with specimens of *C. maritimus*, Rye, found at Portsea, by Moncreaff, and find them quite certainly a distinct species.

It will be seen, therefore, that the views of Rye were quite correct, and it is owing only to their having been neglected by subsequent writers that confusion again prevails.

We have not seen any examples of *C. socius* or *C. maritimus* from other sources than those we have just mentioned, and we are not, therefore, in a position to say whether the French examples pertain to *C. socius* or to *C. maritimus*, or to both, or to neither. In order, however, that this may be decided, we give the following remarks on the scape of the antennæ in the two species.

In *C. socius* the scape of the antennæ is abruptly incrassate immediately it leaves the scrobe, and in addition to this, the scape possesses a rather large supernumerary incrassation on its posterior-inferior face, this incrassation being quite close to the scrobe. In *C. maritimus* the dilatation of the scape does not commence at the base, but a well-marked more slender portion intervenes. If the antennæ of the two species be dis-articulated, it will be found that the basal portion is very differently constructed in the two, but as our object is merely to point out a single character by which the two can be readily distinguished, we need not refer to this and other distinctions in detail.

We may add that there is no sexual difference in the form of the scape, nor have we detected any variation therein; the examples of *C. socius* from the Sierra Nevada being quite similar to those from the Isle of Wight.

When we know more of the distribution of these two species, we may, perhaps, be in a position to make some guesses connected therewith. It certainly is a most extraordinary fact that a very rare and very distinct species should be found on the snow-fields of the Sierra Nevada, and in an arid spot in the Isle of Wight; and if it should prove to be absent from intervening localities, the species will be a greater puzzle biologically than it has proved at present to be nomenclatorically.

[As an addition—small—but of some interest, as being the very latest—to the list of errors and confusions about *C. socius*, it may be added that in the report of the meeting of the Entomological Society, September 5th, 1888, given in the October number of this Magazine, p. 117, Mr. Champion is said to have exhibited *Cathormiocerus maritimus* from the Isle of Wight; whereas, the species exhibited was *C. socius*, and was, in fact, duly announced as such at the meeting.—D. SHARP, October 3rd, 1887.]

NOTES ON SOME BRITISH AND EXOTIC COCCIDÆ (No. 11).

BY J. W. DOUGLAS, F.E.S.

PSEUDOCOCCUS ULMI, *n. sp.*

Fig. 1.

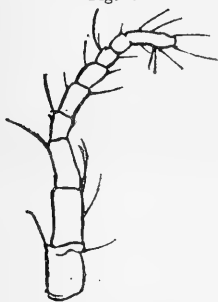


Fig. 2.



Male unknown.

♀ adult. Oval or ovate, brownish-yellow, closely covered on the upper-side with white mealy powder, less so on the lower side; margin all round with distinct, horizontal, conical, white, granulose projections, two of them at the posterior end much longer than the others; about the rostrum many hairs, a scant series along the margins of the body between the projections, six on the ano-genital ring, and four or five on the lobes. Antennæ (Fig. 1) slender, tapering, of nine joints; 1st stout, long; 2nd and 3rd longest of all; 2nd one-sixth longer than 1st; 3rd shorter than 2nd, about as long as 1st; 4th short, half the length of 3rd; 5th one-fourth longer than 4th; 6th shorter than 5th; 7th and 8th still shorter, sub-equal; 9th nearly as long as 3rd, with a long, obtuse apex; all with a few projecting simple hairs, more numerous on 9th joint. Legs (Fig. 2) stout, with distant simple hairs; tibiæ very long; tarsi one-third the length of the tibiæ; claws very short. It should be noted that most of the apical hairs on the antennæ, tarsi and claws appeared to be capitate, but this was due to the adventitious presence of extraneous matter, for under a high microscopic power they proved to be simple. Length, 4, breadth, 2.5 mm.

This species is a near ally of *Ps. aceris*,* *æsculi*, *mespili*, and *platani*, but, according to the descriptions of these species by Signoret (Ess. Cochen., pp. 363—368) it differs from them in several respects, especially in the relative proportions of the joints of the antennæ. It differs still more from *Ps. brunnitarsis* and *Ps. hederæ*, but it resembles them in being devoid of digitules on the tarsi (the former species has them on the claws only).

Thus "*aceris* has the 2nd and 3rd joints of the antennæ the longest, and the others diminishing in bulk and length; *æsculi* the 2nd and 3rd joint the longest, the others diminishing up to the last, which is as long as the two preceding;" *mespili* "the 2nd joint the largest, the 3rd nearly equal, the others diminishing up to the 9th, which is twice as long as the preceding one;" *platani* "the 2nd joint the longest, the others diminishing progressively up to the 9th, which is half as long as the preceding one, the 6th, 7th, and 8th smallest like the 4th, which we also see in *aceris*, whilst in *æsculi* the 4th is nearly equal to the 5th." Of *brunitarsis* it is said that "the 2nd and 3rd are the longest, the 1st twice as thick, the 9th a little longer than 3rd, nearly equal to the preceding two together;" the length of the body of this species is only 1.5 mm. Of *hederæ* it is said that "the 3rd and 9th joints are the longest, then the 2nd, 4th and 5th, the 6th, 7th and 8th the smallest and equal, the 9th one and a half times longer than the 8th."

Ps. ulmi in general appearance, and in the want of tarsal digitules, is like *Ps. ulicis* (p. 88 *ante*); but that is a much smaller insect, and although, as in that species, the 5th joint of the antennæ is longer than the 4th, yet it has not the same proportion, for in the present species the 4th is not so remarkably short; the 9th joint is also much longer; other differences in the form and character of the marginal projections of the body, the ultimate covering, &c., are also apparent.

The species of *Pseudococcus* are slightly yet distinctly differentiated, indicating their descent from a common stock. Except *aceris*, each appears to be restricted to one food-plant.

Towards the end of May, 1886, on an elm bush (*Ulmus campestris*) at Brockley, which I have not been able to visit since at that season, I found five adult ♀ female examples of this insect, of which one on the next day enveloped itself with a close-fitting, felt-like covering, measuring 5 mm. in length; the others were at once killed and served for the foregoing description.

I am indebted to Mr. R. T. Lewis for the excellent camera drawings here reproduced.

8, Beaufort Gardens, Lewisham :

September, 1888.

* In the "Table générale des Espèces," p. 498, of Signoret's "Essai sur les Cochenilles," *Pseudococcus aceris*, as described at p. 363, is attributed, as a species, to Geoffroy, but this is a *lapsus calami*, for Signoret himself, in his "Catalogue des Coccides," at p. 39, cites Geoffroy's *aceris* as an *Aleurodes*; and in his previous "Essai monographique sur les *Aleurodes*" (Ann. Soc. Ent. de France, 4 Ser., Tom. viii, p. 394, 1868, he described the *Chermes aceris ovatus* of Geoffroy as *Aleurodes aceris*, citing Baerensprung (Alton and Burmeister's "Zeitung für Zoologie," p. 176), who said that without doubt Geoffroy had described the larva of an *Aleurodes* under that designation. The name, therefore, is *Ps. aceris*, Sign., *nec* Geoff. This should be noted, as Prof. Comstock (Report for 1880, p. 345), in describing *Ps. aceris* as a native of N. America, follows Signoret in attributing the specific name to Geoffroy.

The dimensions of *Ps. aceris*, ♀, are given (*l. c.*) as "d'une longueur de 4—5 mm. sur 8 de large;" the latter figure is an obvious typographical error, and it should probably be read as "3."

THE LARVA OF *SCOPARIA CEMBRÆ*.

BY JOHN H. WOOD, M.B.

We are so accustomed to associate in our minds the larvæ of the *Scopariæ* with mosses and lichens, that it is quite startling to find one of them, like the subject of this note, feeding on *Pieris hieracioides*, a phanerogamous plant. The part of the plant attacked is the fleshy tap-root, upon which, under a loose web, the larvæ live either singly or several together, scoring and channeling the surface, and occasionally cutting short tunnels through it, when the root is small and tender.

The first larva was found on April 3rd, 1887, whilst I was examining the stems and roots of various plants growing in a disused limestone quarry for anything that might turn up. A month later, another solitary one was obtained, as well as four others of different ages, feeding together on another root. It was astonishing how far beneath the surface these small larvæ—and some of them were not more than three or four lines long—had managed to get. In the loose ballast heaps, the *Pieris* had rooted deeply, and as far as the plant had penetrated, so far had the larva been able to follow, even to a depth of five or six inches. The spinning it uses to protect itself is not at all of the nature of a gallery, but is simply a weak flimsy web, probably just sufficient to keep any loose particles of soil from falling in; though afterwards when reared in vessels exposed to the light, they naturally spin more freely for the purpose of concealment. I kept them in ordinary glasses covered with glass slides, with pieces of the root tied into small bundles, that they might the more readily conceal themselves. They proved most easy to rear: five moths and an ichneumon coming out in the last week of June and in July.

About this time, I learnt from Mr. Stainton that among the papers of the late Mr. Buckler, was the description of some larvæ feeding on the roots of *Tussilago farfara*, that had been sent him by Mr. J. Gardner, of Hartlepool, and were supposed to be this species. No moth, however, was reared. That Mr. Buckler's larva was *cembræ* there can be little doubt, from the correspondence of our respective descriptions, although, as might have been expected, his more skilful eye had detected some points that had escaped mine. It seemed, therefore, advisable that I should make a further and more careful examination of the larva; besides, my notes of the young larva, which in one important point, is quite different to the mature one, were altogether deficient, and here Mr. Buckler could not help me, as

he had only seen the full-grown larva. I made various unsuccessful attempts to find it at the commencement of the present year, both in the *Picris* and the *Tussilago*, of which in one or two spots there was a good growth, and it was not until March 27th, that I at last succeeded in meeting with it in the *Picris*. Again there were four larvæ at the same root, and with the same inequality in their ages—extended in walking the smallest measured $3\frac{1}{2}$ lines, the biggest $7\frac{1}{2}$ lines, the latter I should judge being two months in advance of the former. This inequality was retained throughout, for on June 2nd, a moth emerged, whilst one larva still remained feeding.

The two youngest larvæ I have seen were of slender shape, and of nearly uniform width. The head shining brown. The colour in the one a semi-transparent greenish-white, with the spots very conspicuous, large, black, and prominent; in the other the green tint was absent, and the spots were dark grey, not black. The hairs black and bristly. They were between three and four lines long, and were probably in their second skin. With the next moult, an apparent transformation occurs in the spots. To the naked eye they now appear small, black, and bristly; but it is only an optical illusion, due to the loss of colour in the spot, and the consequent prominence of the insertion of the black bristly hairs. At this stage it begins to assume a glistening appearance. No further change takes place in the next moult, but in the following and last one, the bristly look of the spots disappears, and the larva acquires a smooth glossy look. In this its last skin, it is a long and rather slender larva, tapering but slightly, and more in front than behind. The segments plump, with the divisions and the ordinary transverse wrinkle across the back well marked. Head clear shining brown, with darker mouth. Plates also shining, the thoracic one a very pale brown, the anal pale ochreous. The colour translucent white, allowing the food canal to be seen, especially in the anterior segments, to which it communicates sometimes a black, sometimes a purplish, hue. The black dorsal vessel shows at intervals. The spots, which are slightly tinted with ochreous, are very large and flat, covering a large part of the surface, and from their glossy character give the larvæ the glistening appearance. The hairs are dark and bristly, and the spiracles round and black. At all ages it is a very active larva, rolling into a ring, and ejecting a black fluid when alarmed. The cocoon, made of particles of soil and gnawings, is attached to the root, and in shape is a short oval with blunt ends. The pupa has no peculiarity of form, and is pale red, with yellowish wing-cases:

The general appearance of this larva is thoroughly that of a *Pyralid*, though it does not, especially in the later stages, quite come up to my notion of what a *Scoparia* larva ought to be. The slender elongate form, the glistening surface, the pale and flat spots, and the habit of rolling into a ring seem as much out of order, as does the selection of its food plant.

Tarrington, Ledbury :
September, 1888.

NOTES ON ACULEATE HYMENOPTERA.

BY R. C. L. PERKINS.

Smith, in the first edition of his "Bees of Great Britain," gives descriptions of several *Andrenæ*, closely allied to *A. Afzeliella*, Kir., which he considered to be distinct species. They are: *A. xanthura*, Kir., *A. Wilkella*, Kir., *A. convexiuscula*, Kir., *A. fuscata*, Kir., and, lastly, *A. similis*, Sm., which was placed by him next to *A. albicans*, Kir., to which it has some superficial resemblance, but no structural affinity.

In his second edition, he sinks *Wilkella* as synonymous with *xanthura*, and in both editions he expresses doubt as to the right of *fuscata* to specific rank.

Mr. Saunders, in his "Synopsis," describes two species only, *A. Afzeliella*, Kir., and *A. Wilkella*, Kir.; *convexiuscula*, Kir., being given as a stylopized form of the former, and *fuscata*, Kir., as merely a variety with black posterior legs. Under *Wilkella* he describes a species of which *similis*, Sm., is the ♂, but I have satisfied myself from Kirby's descriptions—corroborated by a further examination by Mr. Saunders of Kirby's types—that he was mistaken in considering it as *Wilkella*; it will therefore have to stand as *similis*, Smith.

Thomson, in his "Hymenoptera Scandinaviæ," makes several species, but his *xanthura* apparently does not occur with us; its chief characteristic seems to be its long tongue, as he says, "*lingua valde lineari elongata*."

His *intermedia*, however, is, I believe, by no means rare; it is very like *Afzeliella*, and I have not been able to find any good character whereby to separate the females of the two, though the males are not very difficult to distinguish. In this case it seems better to regard it, at present, as a variety of that species; as *Afzeliella* is double-brooded, the variation may be due to the different length of time passed in the earlier stages; at any rate, the time so spent does vary considerably, as the autumnal brood is in most cases only a partial emergence. Besides, we do not know whether the offspring of the second brood appear in the following spring, or wait until the autumn comes again. Regarding *fuscata* as a variety of *Afzeliella*; without doubt, and *convexiuscula* as probably only altered by the attack of *Stylops*, we may separate three distinct species as follows:—

- 1 (2). Clypeus with silvery-white hairs in both sexes.

Abdomen of the ♂ without distinct pale fasciæ, only faint indications laterally

♀ with the post-scutellum very densely clothed with rich brown hairs.
similis, Smith.

- 2 (1). Clypeus with brownish or yellowish hairs (♂), or pale fulvous (♀).
 ♂ with distinct pale abdominal fasciæ.
 ♀ with the post-scutellum not very densely clothed, and with paler hairs.
- 3 (4). ♂. Antennæ longer, 3rd joint very short and wide, the hairs on the face paler, and those on the thorax, &c., beneath rather silvery, hardly tinted with fulvous.
 ♀. Wings fulvo-hyaline; the *central* portion of the basal segment of abdomen very closely, distinctly punctured. Anal fimbria golden...
xanthura, Kir.
- 4 (3). ♂. Antennæ shorter, 3rd joint less short and broad, face with brownish hairs (or with paler hairs, and the 3rd joint of antennæ sub-equal to the 4th, and the abdomen more shining, = var. ? *intermedia*, Thoms.), mesosternum, &c., with the hairs distinctly pale fulvous.
 ♀. Wings with no fulvous tint: central portion of basal segment faintly, indistinctly punctured, or impunctate: anal fimbria dusky (or pale, and with the abdomen rather more shining, = *intermedia*, Thoms.)..
Afzeliella, Kir.

A variety like the var. *fuscata* of *Afzeliella* is equally common in Thomson's *intermedia*: but as to the stylopized form (*convexiuscula*), I am not certain, whether it is a variety of *Afzeliella* only, or whether there is not also a stylopized var. of *xanthura*.

When worn, the ♀ of *similis*, Sm., might, perhaps, be confused with that of *xanthura*, Kir., as both have fulvo-hyaline wings, and the anal fimbria golden. The more shining and much more lightly punctured abdomen (especially on the basal segment of the former) will easily separate it.

Similis seems to be a rare or overlooked species, and appears during the latter half of April; so far as I know, there is one brood only. I have taken it rather freely at Oxford.

Xanthura appears about the 15th of May, and may be taken abundantly throughout June and July; much faded ♀s are to be found in August, and this year, owing to the wet season, this sex was still out in September. It is common everywhere, and rather partial to clovers. *Nomada ochrostoma* is commonly parasitic on it; it is only single-brooded.

Afzeliella is the earliest of these bees, appearing at the beginning of April; a second brood comes out at the end of July and in August. The var. ? *intermedia* is often found with it, and is also double-brooded; but sometimes this form appears to be found away from the typical species. Both are common in sandy localities, but they are, perhaps, less general than *xanthura*.

The synonymy of these species is rather confused, but would appear to be as follows:—

Andrena Afzeliella, Kirby, Smith, E. Saund.

A. xanthura, Kir., Smith, Ed. ii, ♂ ♀, Ed. i, ♂ = *Afzeliella*.

A. similis, Smith (♂ only), = *Wilkella*, E. Saund., ♂ ♀ (*nec* Kirby).

Further, it must be remarked that the ♂ given by Smith to *Afzeliella* is almost certainly the form *intermedia*, Thoms.

It is curious that Smith, in his first edition, should have given ♂ *Afzeliella* to *xanthura* when he states that the latter appears in the middle of May; and then, in the second edition, he gives its true ♂ to *xanthura*, and states that it appears in the middle of April. Males taken in April should be carefully examined to see whether they are not the brown-faced ♂ of *Afzeliella*, rather than that of *xanthura*. Apparently Smith did not distinguish between these, but as mentioned above, regarded the ♂ of *intermedia*, Thoms., only as the ♂ of *Afzeliella*.

For the last three seasons, at Oxford and elsewhere, I have known of large colonies of *xanthura*, and had them constantly under my eye; the first ♂s have appeared about the middle of May, but were rather later this season. It is strange that I have never taken a single specimen, ♂ or ♀, of *Afzeliella*, in the neighbourhood of Oxford.

Through the kindness of Messrs. Bridgman, Harwood, and Saunders, I have been enabled to examine a large number of specimens of these bees and their varieties from different localities, and thereby to gain a far greater knowledge of the different species than I could have done from my own series alone; I am also indebted to Mr. Saunders for quotations from Thomson, and the loan of his types from which he described in his "Synopsis." Finally, I should point out that the distinctions between the species, which I have given above, are not exhaustive, but they are the least variable, and the easiest to grasp, of any that I have discovered.

Jesus College, Oxford:

October, 1888.

[The *Afzeliella* group has always been a puzzle to me, and I am very pleased that Mr. Perkins has been able to unravel its apparent mysteries. I believe he is quite right in his determinations. Kirby's types are very much worn and faded, but I have little doubt from my last examinations that *xanthura*, Kirb., and *Wilkella*, Kirb., are synonymous, and distinct from *similis*, Smith; the wonder to me is, that Smith did not know the ♀ of his *similis*, as I have taken it at Wandsworth, Reigate, Chobham, and Woking, and Mr. Enock has taken it at Hampstead, one of F. Smith's favourite hunting grounds.

He must either, like myself, have mixed it with *xanthura* or else he must have been singularly unfortunate in not meeting with it. In fresh specimens it is distinguishable at a glance, but in worn ones its resemblance to *xanthura* is extreme. The finer puncturation of the first abdominal segment in *similis*, as Mr. Perkins points out, is the only character to rely upon in rubbed examples, but even this varies a little, which makes the determination of indifferent specimens very difficult.—E. SAUNDERS.]

Rare Hymenoptera at Woking.—Although this year has not been one in which sunshine has abounded, still, on the few occasions that I have had for collecting *Hymenoptera*, I have found them quite as abundant as usual. I was on Woking Heath on the morning of July 26th, and on one little spot near the high road to Chertsey, where there is a slightly raised bank and a large patch of *Potentilla tormentilla* growing on it, I caught the following in about two hours:—*Pompilus Wesmali*, ♂, and *P. gibbus*, ♀. *Aporus unicolor*, ♂—of this great rarity very few British examples are known, and Woking is a new locality for it. *Mimesa Dahlbomi* and *equestris*—common, but I only got males. *Oxybelus mandibularis*—another rarity, which hitherto has only occurred at Littlehampton, Hayling Island, and Bournemouth. *Andrena analis*—commonly, &c.

Dr. Capron has visited the locality once or twice since, and has succeeded in capturing another *Oxybelus mandibularis*, and the following:—*Ceropales maculata*, the two species of *Mimesa* mentioned above, *Pompilus viaticus*, *Evagethes bicolor*, *Oxybelus uniglumis*, *Sphecodes affinis* and *pilifrons*, *Andrena decorata* (♀) and *analis*, *Epeolus variegatus*, *Nomada Roberjeotiana* (♀), always one of our rarities, *Ellampus Panzeri*, and the pretty fly, *Anthrax fenestrata*, which he tells me is recorded by Walker as rare in the South and West of England during August and September. I have taken it at Chobham, where it generally seems pretty common.—EDWARD SAUNDERS, St. Ann's, Woking: September 12th, 1888.

Ravages of Lophyrus pini.—Whilst collecting insects, on the 7th inst., on the estate of Anthony Wilkinson, Esq., Shernton, about eight miles from here, I met with Mr. Barron, his woodman, who informed me that in a small plantation of young trees, about six acres in extent, belonging to a neighbouring landowner, the Scotch firs were infested with myriads of larvæ which were completely stripping the young trees; as I expressed a strong desire to see them, he very kindly offered to accompany me to the wood, some two miles away. Upon arrival I found he had not overstated the case, for every tree was infested with hundreds of larvæ of a sawfly, often two or three batches upon one tree, eating almost exclusively the old or last year's needles and leaving this year's growth untouched; in some cases, where the supply of old needles had fallen short, they had actually gnawed the bark; I noticed one tree that was entirely stripped of the old foliage, not a single needle left! and I did not see a single tree in any part of the plantation that we visited but what was infested with

the larvæ. They were of the usual sawfly character, gregarious, and when disturbed, ejecting a drop of watery-looking fluid; colour dark dirty green, with a yellowish dorsal and spiracular line, the latter edged with lighter; length, 1 to 1½ inch. What is very strange about the appearance of this pest is that Mr. Barron, who is apparently a man of about sixty years of age, and who has been about the woods in the district all his life, had never seen the larvæ before, and the question is how has it been introduced? It seems highly probable that eggs must have been upon the trees when planted. Should the pest spread to the many plantations round about, it will be a serious matter, and if any of your readers can suggest a means of destroying them, I feel sure the information will be appreciated. Mr. Barron suggested introducing a few colonies of the black ant, which seems a good idea, provided they would eat the larvæ and reconcile themselves to settling in the wood, which latter I somewhat doubt as it is clay land, whereas I have not seen this ant in any places but where the soil was loose and friable.—J. GARDNER, 8, Friar Terrace, Hartlepool: *July 18th, 1888.*

[On submitting Mr. Gardner's letter to the consideration of Mr. P. Cameron, that investigator of the habits of our sawflies has replied as follows:—"The species is *Lophyrus pini*. It is often destructive, but never, so far as I have noticed, continuously so in the same wood. I have seen it abundantly in a locality one year, while in the next hardly a specimen could be found. I hardly know which will be the best way to destroy the larvæ. Beating them into an umbrella or sheet and burning the larvæ thus obtained would be a good plan if the people would only take the trouble, or the Pyrethrum extract, as used by the Americans, might be applied by means of a syringe. The larvæ pupate in moss, &c., at the foot of the trees. I have never seen ants eat the larvæ."—EDS.]

Sirex gigas at Armagh.—On August 25th, a ♀ specimen of the above was brought to me, which had been caught in the timber yard of Messrs. R. Turner & Co., by Mr. J. Walker, and on August 31st another specimen, also ♀, was brought to me, which had flown into a grocer's shop. I suppose that both had emerged from timber in Messrs. Turner's yard.—W. F. JOHNSON, Armagh: *October, 1888.*

Chrysopa tenella, &c., in West Yorkshire.—On June 23rd last I secured two specimens of *Chrysopa tenella* in Wharnccliffe Woods, near Sheffield, and am pretty sure I saw and let go other specimens, as although I noticed they looked very small, I had no suspicion that even the two I boxed were anything more than a very common species, until setting them out a day or two afterwards. The only other specimen of *C. tenella* I have I took in August, 1886, at Saltburn, on our east coast, so that the species is evidently widely distributed in this county. At the end of June I found *Micropterna sequax* common on a narrow shallow stream running through Pennyspring Wood, Huddersfield, and *Wormaldia occipitalis* was still more plentiful at the same time. On August 5th, *Beræa pullata* was abundant in the same wood on herbage growing under wet rocks at the top of the stream.—GEO. T. PORRITT, Huddersfield: *October 8th, 1888.*

Corydalis asiatica, Wood-Mason.—This species (the sole Asiatic representative of an otherwise American genus) was described and figured by Prof. Wood-Mason, in the Proceedings of the Zoological Society of London for 1884, p. 110, pl. viii, from one ♂ and two ♀ taken in the Naga Hills, Assam.

I am indebted to Mons. Wailly for a ♂ (unfortunately, much mutilated) of what is no doubt the same species, from the same district. The markings of the head and prothorax differ slightly from those of the type, as figured. The mandibles seem slightly longer and more slender, and it is only the right mandible that bears a minute, sub-apical, internal tooth; points of no great importance. My specimen had evidently been considered a very vicious and dangerous animal by its captor, for it still bears the remains of a noose of fine cord round its prothorax; and its wings have been almost entirely destroyed, probably to prevent escape; moreover, the end of the abdomen is wanting, which is unfortunate; but the head and thorax are intact. Considering the interest of the insect, and its rarity, I think it useful to place this specimen on record.—R. McLACHLAN, Lewisham, London: July 7th, 1888.

Adrastus pusillus, Fabr., Candz.: a *Coleopteron* new to the British List.—While collecting in July in the open ground three or four miles from Sandwich, I swept up from the long coarse grass several specimens of *Adrastus pusillus*, a species hitherto not recorded as British, although apparently common all over Europe. *A. pusillus* may at once be distinguished from *A. limbatus* by its generally much smaller size, and very much darker colour (some specimens being pitchy-black, with pale shoulders only), and also by the antennæ being dark brown after the third joint. In the same neighbourhood, *Athous difformis* was quite common, but I only found one ♀. I may also mention the following: *Ocyopus pedator*, *Thalycra sericea*, *Agaricophagus cephalotes*, *Scydmanus angulatus*, *elongatulus*, and *præteritus*, and *Diacanthus bipustulatus*; *Lamprosoma concolor* was very common in damp places.

One calm sunny morning, *Homaloplia ruricola* was flying about in numbers amongst the grass in one spot. By examining a great number, I succeeded in obtaining several examples of the black variety, a form which I had not previously met with. The last time I visited this neighbourhood, I took *Anisotoma picea* and *Dictyopterus minutus*, but could not find either again.—EDWARD A. WATERHOUSE, 23, Spencer Road, Putney: August, 1888.

Coleoptera at Shooter's Hill, Kent.—On August 14th, 1886, I found, under bark of a decaying oak tree in Shrewsbury Park, two beetles, which, on returning home, I found to be the scarce *Lamophlæus bimaculatus*. The next day I found fourteen more, but could not find any more either this or last year. *Prognatha quadricornis* was also plentiful. I have also taken by sweeping one specimen of *Conopalpus testaceus* in Crownwood's Lane, Shooter's Hill, July, 1886.—JAMES MALINGS, Holmeleigh, Shrewsbury Park, Shooter's Hill: October, 1888.

Coleoptera at Sandown, Isle of Wight.—In the last volume of this Magazine (pp. 136—138) I gave a List of *Coleoptera* found by myself in the Isle of Wight, chiefly at Sandown. The additional species mentioned below were observed either

by my friend, Mr. R. W. Lloyd, or myself during the latter part of June or beginning of July of this year. Constant search for *Baris analis* failed to produce a single specimen, and *Sitones cambricus*, though plentiful enough last year, did not put in an appearance; but in their place several interesting *Carabidæ*, *Staphylinidæ*, &c., not observed in 1887 were obtained.

Upwards of 250 species were obtained, of which the following are the most noteworthy additions to my list:—*Harpalus cupreus*—plentiful, beneath stones in sandy places along the margins of a corn field; this insect appears to be extremely local, though possibly overlooked for *H. æneus* or *Pterostichus cupreus*, both of which occur in company with it. *H. tenebrosus*—a single example, found in company with *H. serripes* and other common species at the base of the sandy cliffs. *Æpus Robini*—a few specimens in its usual habitat: though *A. marinus* was to be found in vast profusion in a locality within sight of the place where *A. Robini* occurred, I did not observe the two species in company. *Sipalia testacea*, Bris.—upwards of thirty examples; this species has precisely the habit of *Æpus*, and occurs in company with it; I met with an example at Ventnor in 1885, and the insect is now known from four British localities, Whitstable, Sandown, Ventnor and Weymouth, in three of which it has been found by myself. *S. testacea* is doubtless to be found all along our southern coast, if looked for in its proper habitat. *Ilyobates nigricollis*—a very large example, with reddish head and thorax, occurred on the beach. *Cafius fucicola*—not rare, in putrefying seaweed, after rough weather; male specimens occurred with the head very largely developed, suggestive of the var. *variolosus* of *C. xantholoma*. *Diglossa mersa*—not uncommon, with *Æpus*. *Euthia scydmanoides*—a single specimen on the sand. *Claviger foveolatus*—rarely, on the chalk downs. *Actinopteryx fucicola*—rarely, on the beach. *Dolichosoma nobile*—small, narrow, and more shining examples are occasionally to be found in company with the typical form, so abundant in the island; these small examples somewhat approach *D. protensa*; the latter is recorded from the Isle of Wight, but possibly in error. *Abdera bifasciata*—a few specimens, beaten from stumps of broken-off boughs of young oaks. *Phlæophagus æneopiceus*—rarely, at the foot of the cliffs. *Cænopsis Waltoni*—rare, in company with five species of *Trachyphlæus* and *Cathormiocerus socius*. *Cassida hemisphærica*—a single example.—GEO. C. CHAMPION, 11, Caldervale Road, Clapham, S.W.: September, 1888.

Prionocyphon serricornis, &c., at Mickleham.—Mickleham, as a collecting ground for the Coleopterist, seems to be as productive as ever. On August 24th, between 4 and 5 p.m., I swept up *Prionocyphon serricornis* (1), *Thalycera sericea* (2), *Anisotoma grandis* (♂ ♀), and *A. parvula*, *Mordellistena humeralis*, *Aphodius Zenkeri*, *Amphicyllus globus*, *Liodes orbicularis*, &c.—ID.

Our Hessian Fly.—In August, 1887, there was sent me in reply to a note from farmers and others connected with agricultural pursuits, in the counties of Cambs., Norfolk, Suffolk, and Wilts., stems of wheat and barley, each stem having one, two, and three pupæ attached; also I had a bagful of barley screenings sent in October, and by searching I found numbers of pupæ, some completely eaten out by an *Acarus*, the rest I carefully preserved, hoping to rear perfect specimens in May, but the cold

nights and N.E. winds no doubt were the cause of their not appearing; the few hot days in June brought out from some, the lovely little ichneumon, *Chalcis micans*, it was very amusing to watch them running about examining the straws for their victims. The remaining pupæ will now hibernate; they are alive.—J. BROWN, 5, King's Parade, Cambridge: *August 3rd*, 1888.

Where does Gonepteryx rhamni hibernate?—To this query, propounded by Mr. G. H. Kenrick, at p. 92, *ante*, I am able to reply, but only by a single isolated observation made several years ago, and which I communicated at one of the meetings of the Belgian Entomological Society. The observation was made quite at the end of a year. Certain shrubs were being uprooted in the park at Longchamps, and I found, concealed amongst the dead leaves at the foot of the stem of a laburnum, a *G. rhamni* absolutely torpid. Mr. Kenrick (*l.c.*) finding that *G. rhamni* is not protected for hibernation by the coloration or markings of its wings, thinks it possible there may be no real hibernation of the perfect insect, but a retardation in emergence from the chrysalis in those individuals that fly in hot days in winter and early spring. I regret not to be able to share this supposition, seeing that the *G. rhamni* which fly in winter are ordinarily recognisable by their faded coloration, and especially so as to the rosy colour of the antennæ, &c. This species inhabits the whole of Europe, and the greater part of northern Asia, and is generally common, even in small town gardens at the end of summer. Up to now, species of *Rhamnus* are the only food-plants indicated for the larvæ, but I often ask myself whether these do not feed also on other plants, for species of *Rhamnus* do not grow everywhere, and are usually absent in town gardens.—E. DE SELYS-LONGCHAMPS, Liège, Belgium: *October 4th*, 1888.

[Dr. Rössler, in his "Lepidoptera of Wiesbaden," p. 20, remarks that the torpid imago hibernates on the ground amongst fallen leaves.—EDS.]

Deilephila galii pupating underground.—In the October number of this Journal, I state that this species does not go underground to pupate. This I find is not in all cases correct: as in two biscuit tins that I brought home from Deal containing some of my full-fed larvæ, and which had some three or four inches of light sand at bottom, I found, on turning them out (as the portions of plant and frass showed too much signs of mildew), that six of the larvæ had pupated from one to two inches beneath the soil, and had formed fairly compact cocoons of silk and grains of sand. Several had spun up just on the surface, but the greater number had formed simply a loose cocoon amongst the stems of the food-plant, still, it is evident that some of the larvæ do pupate beneath the soil.—W. H. TUGWELL, 6, Lewisham Road, Greenwich: *October 1st*, 1888.

Profusion of larvæ of Lasiocampa rubi.—In a Glen off Loch Killary, Co. Mayo, I, yesterday, saw an enormous number of these larvæ, often five or six in a square foot, a dozen could be picked up anywhere without moving, and from any standpoint from one to two hundred could be seen. They were as numerous as this for several miles, and for a width of probably half a mile, but this I did not determine. On this side (the south) they were protected from the south and west, on the opposite side,

where they would have more sun and be equally protected from the west, they were about the average of the rest of the district I have seen, viz., about one every eight or ten yards. In some other Glens there were exceptionally a dozen or so in sight at once. Very few were quite full-fed, and most in the last skin but one, and many younger. At one to a square foot there would be about 50,000,000 on the area observed.—T. A. CHAPMAN, Firbank, Hereford: *September 19th*, 1888.

Note on Triphosa dubitata.—Yesterday (September 2nd), a ♀ *T. dubitata* came to a gas-light in my room; she scorched her wings and fell on the table, I put a cover over her until the morning, when, to my astonishment, I found she had laid a number of eggs.

Now, *T. dubitata* hibernates completely; and before this, it was a firm article of my faith that no hibernating insect ever laid its eggs until the spring; are there other exceptions to this rule? How, for example, does *C. miaria* behave? Of course, insects like *Camptogramma fluviala*, which do not sleep through the winter, but fly on warm nights, lay their eggs like other moths, but their case is quite different from true hibernation.—R. C. R. JORDAN, 105, Harborne Road, Edgbaston: *September 3rd*, 1888.

Description of the larva of Ypsolophus Schmidiellus, Heyd. (Nothris durdhamellus, Stn.).—Ground-colour pale creamy-white, with a horny brown dorsal plate on the second segment. The third and fourth segments are of a deep rich purplish-brown, interrupted at the segmental divisions with the ground-colour. The central dorsal stripe is deep brownish-purple, on each side of which is a broad sub-dorsal stripe of the same hue extending the whole length of larva, exclusive of the last segment; on the interior of these stripes is a row of minute deep purplish tubercular dots (two on each segment) from the fifth to the eleventh segment inclusive (the twelfth having but one dot), the foremost being placed at the juncture of the stripe and the ground colour, the hinder one just within the purple stripe. A single very fine hair is emitted by each of these tubercles. Adjoining the exterior of the same stripes is a row of small hairy tubercles, one on each segment, omitting the twelfth and thirteenth, ringed beneath with purplish, the hairs are very fine, and are scarcely discernible without the aid of a good lens. The spiracular line consists of a row of very fine spots of paler purplish, beneath which is another row of very minute tubercles, inclining to mauve, emitting a single fine hair visible under a lens.

The head is blackish-brown, fore-legs blackish, prolegs creamy.

Length, about 12 mm.

The larva pupates at the end of June and beginning of July. The pupa is of a pale chestnut colour, the cocoon being formed of the leaves spun together, similar to the chamber in which the caterpillar lives, only spun firmly together all round.

Dr. Jordan and I found the larva not uncommon on *Origanum vulgare* at Teignmouth during the middle of last June; it rolls up the leaves of that plant with fine white silk, leaving, as a rule, both ends open. When quite full-fed the creamy ground is much intensified, whilst the purplish stripes, though remaining perfectly distinct and marked, lose somewhat of their deep velvety appearance.

I reared two perfect insects (♂ ♀), which appeared on July 25th and 29th respectively.—G. T. BAKER, 16, Clarendon Road, Edgbaston: *September 14th*, 1888.

Description of the larva of Nothris durdhamellus.—In June last I met with the larva of *Nothris durdhamellus* not uncommonly on the chalk a few miles from Lynn. From these I reared the moths at the end of July. Although a comparatively common species in the chalk districts of the south of England, it has not, as far as I am aware, been previously observed further north than Essex.

Its larva is so pretty and curious that it deserves a more detailed notice than it seems hitherto to have received. It is slender and active, having the tremulous motion of the head and anterior segments so characteristic of the *Gelechiidæ*. Colour greenish-white with smoky-brown dorsal and sub-dorsal lines, spots white with black centres. The third and fourth segments are curiously swollen, and entirely of an intense black, so that the creature looks as though two thick black rings had been fitted upon its body. Head black, dorsal plate greenish in front, black behind, anal plate not visible, feet black, claspers whitish. It joins together the edges of a leaf of marjoram (*Origanum vulgare*) from the upper-side, and lives in the tube thus formed, feeding on the tip of the leaf. When it has eaten the tip away it moves to another leaf and joins its edges in the same manner, so that each larva makes many tubes. When full-fed it leaves its habitation and pupates on the ground.—CHAS. G. BARRETT, King's Lynn, Norfolk: September 15th, 1888.

Habits of Coccyx distinctana and Grapholitha nigricana.—Early this summer I discovered that in a wood to which I obtained access, and which consisted largely of firs of different species, there were, here and there, silver firs (*Pinus picea*), many of them of fair size, some very large. Upon these in June I found *Coccyx distinctana* scarce at first, but towards the end of the month more plentifully. *C. tædella* (*hyrciniana*) was at the same time abundant among the spruces (*Pinus abies*) with *C. nanana* in smaller numbers, and the former often strayed to the silver firs, but except in very violent storms of wind, I never found *distinctana* among spruce.

The sexes of this species differ considerably in colour, the male being grey-brown with the fascia narrow, and the female much tinged with richer brown and with a far broader fascia.

I noticed a curious and rather suggestive circumstance in the habits of this species. It is hardly necessary to state that nearly the entire month of June was cold, with N. and N.E. winds, for no one can have forgotten it, but the 25th was an exception, a genuine summer day, hot and calm. On this day I found *distinctana* in plenty on the lower branches of the silver firs (where they had previously been scarce), and great numbers of them were *in cop*. The females were in fair condition, though not perfectly fine, having been out for a week or two, but the males were so worn as to be hardly recognisable. Yet none appeared to have paired previously and it seems probable that but for this one hot day, *distinctana* might have almost disappeared from this locality. On this same day the first specimens of *Grapholitha nigricana* appeared, attached solely to *Pinus picea*. Others occurred from time to time until the middle of July, but always rarely.—ID.

Thecla w-album at King's Lynn.—Sixteen or eighteen years ago I saw several *Theclæ* flying about the top of a wych elm a few miles from Norwich,

but although I climbed to the top of the tree and tried every plan I could think of to obtain them, not a specimen could be secured, nor even seen closely enough to make sure of the species, which, nevertheless, I felt certain must be *w-album*. No record of its occurrence in Norfolk, either before or since, has reached me, and my surprise may therefore be imagined when my son, going down stairs early one morning in July, spied a specimen sitting on the outside of one of the front windows of this house, and secured it. It is in good condition, and can hardly have flown far, but the weather was bad, and we did not discover its habitat, although wych elms are common enough here. I have not had a larva of the species for years, and it could not have been reared by us.

This pretty little butterfly seems to have been unusually plentiful this year in its known localities. Mr. Perkins writes me that it was in thousands in the Wiltshire Woods when he went down, but worn. Half-a-dozen each were to be seen on many flower heads of ragwort and privet, it was also all over the blossoming limes and the foliage of sunny bushes.—ID.

Food-plant of Crambus fascelinellus.—A visit to Yarmouth a few weeks ago furnished satisfactory evidence that *Crambus fascelinellus* is still holding its own on that coast. The season had evidently been against it, for not only was it late in emerging, but apparently some of the larvæ had not been able to feed up. We found several which appeared to be about to pass another winter in the larva state.

The grass (*Triticum junceum*) at the roots of which I formerly found them, appears to be very much less common than it used to be, but the insect has found a substitute in a very much more local grass (*Aira canescens*) which is common there, and among the roots of which the larva-tubes and empty cocoons were found, as well as the few living larvæ. The moths fade almost directly they emerge, and very few showed any brightness of colouring.

Eubolia lineolata was common among the *Galium*, and supplied pretty varieties, and *Agrotis præcox* was more frequent than usual under the overhanging tufts of grass roots.—ID.

Variations of Agrotis cursoria.—I am more than ever pleased with the charming forms of this insect which I find on the Norfolk coast. The most striking variety is perhaps that which, having no trace of the usual brown clouding, is of a lovely pale fawn or soft drab colour, with the orbicular and reniform stigmata clear yellowish-white, the spaces outside and between them black-brown, the claviform stigma and a basal streak black, and a broad whitish stripe along the costa. Another, much rarer, has the whole wing tinged with slate colour, with the orbicular and reniform stigmata whitish; another wholly pale straw colour, except that the two stigmata just mentioned are white, as is the costal margin, and the claviform stigma blackish. In many cases the median nervure is white to the middle, or even to the margin. Another pretty form is of the more ordinary drab colour, but without brown clouding, and having the first and second line distinctly blackish. Hardly two specimens are alike, and the varieties run into each other and into the typical form, which here is not the commonest.—ID.

Re-occurrence of Tortrix piceana, L., in Britain.—After long waiting, I have at last the pleasure of announcing the re-discovery of one of our rarest Tortrices.

My friend, Mr. S. J. Capper, of Liverpool, when looking over a box of miscellaneous insects collected by Mr. Charles Gulliver, of Ramnor, Brockenhurst, found three specimens of a *Tortrix*, which he judged to be *Tortrix piceana*, L. Mr. Gulliver did not know what they were, and thought them of little importance, but gave them to Mr. Capper for investigation. Two of them were forwarded to me and proved to be unquestionable *piceana*, ♂ and ♀ in fine condition.

It will be remembered by those who have studied the Tortrices that the original specimen was taken in the New Forest, by Mr. Stone, and this specimen I have seen in Mr. E. Shepherd's collection. A second was taken by myself many years ago on the borders of Hants. Some remarks on this species will be found, *ante* vol. ix, p. 215.

The larva is said to feed on *Pinus picea*, *abies*, and *sylvestris*.

It is curious that this species should at last turn up, so closely upon the discovery in this country of its near congener, *decretana*.—ID.

Coleoptera at Carlingford.—I spent from July 9th to August 4th at Carlingford, which is a small town on the southern side of Carlingford Lough. I found the neighbourhood decidedly productive of *Coleoptera*, though these were practically only procurable by one method, viz., turning stones. Sweeping was almost useless, and there were scarcely any ponds suitable for the water net. The localities were the mountain at the foot of which Carlingford is built, the shore of the Lough down to Greenore, the sea shore from Greenore to Laggan Point, and the sea shore at Bellurran; all these are in the County Louth.

The mountain rather disappointed me, for I expected more from it than I got. I can only account for the scarcity of specimens by the practice of burning the heather. Evidently, however, fire agrees with ants, for they swarmed in all directions.

The *Geodephaga* were represented by *Carabus nemoralis*, the elytra of *Carabus catenulatus* (no amount of searching could produce the living insect), *Notiophilus aquaticus*, *N. palustris*, and *N. biguttatus*, *Nebria brevicollis*, *Clivina fossor*, *Trechus minutus*, *Pterostichus madidus*, *P. vulgaris*, *Amara ovata*, *A. aulica*, Panz. (*spinipes*, Auct., *nec* Linn.), *Olisthopus rotundatus*. The only notable capture among the *Hydradephaga* was *Agabus congener*. In *stercore ovino* were *Cercyon unipunctatum*, *C. melanocephalum*, and numbers of *Aphodius rufescens*, also *A. ater*. *Staphylinidæ* were few and far between, on the mountain side: *Ocypus cupreus*, *Quedius tristis*, *Q. molochinus*, *Q. attenuatus*, *Astilbus canaliculatus*, *Tachinus marginellus*, *Xantholinus punctulatus*, and *Othius melanocephalus* were the representatives of the Family. The other Families are almost unrepresented on the mountain. A couple of *Dascillus cervinus* were got on the heather, also one or two *Helops striatus*, one *Byrrhus fasciatus*, and two *B. Dennyi*. Mrs. Johnson made the capture of the mountain by taking two specimens of *Orobitis cyaneus* from under a stone on the side of the slopes. Of course, we tore up all the stones, and ransacked every likely bit of herbage, but no more were to be got. Sweeping the heather produced half a dozen *Ceuthorhynchus ericæ*. These complete the list, as far as the mountain is

concerned, and I may add that none were taken in numbers, and all cost severe toil in climbing and in turning over stones, large and small.

If the mountain was unproductive and disappointing, the shore was the reverse, and fully compensated for the sterility of the former. The great bulk of my captures were *Geodephaga* and *Staphylinidæ*; the most productive part of the coast was between Greenore and Laggan Point.

On the Carlingford shore, *i. e.*, the shore of the Lough from Carlingford to Greenore, I took *Pogonus chalceus* and *Dichirotrichus pubescens*, both tolerably plentiful in certain spots under stones, and *Tuphria nivalis*, only two specimens; under stones and among seaweed were *Ocypus ater* (rather plentiful), *O. compressus* (one specimen among seaweed), *Creophilus maxillosus*, *Xantholinus glabratus*, *X. tricolor* (this species also occurred at Greenore and Bellurgan in rotting seaweed), *X. atratus*, *X. punctulatus*, *X. linearis*, *Aleochara tristis*, *Oxytelus nitidulus*, *O. tetracarinatus*, *Lathrobium fulvipenne*; in a lime near the shore I took one specimen of *Chrysomela Banksii*, and sweeping some thistles produced *Apion pisi*.

The Greenore shore was very productive; my principal captures were *Amara fulva*, *A. apricaria*, *A. bifrons*, Gyll. (*livida*, F.), *Calathus fuscus*, *C. mollis*, *C. micropterus*, *Brosicus cephalotes*, *Harpalus æneus*, F. (*Proteus*, Payk.), of all colours and sizes, *H. tardus*, *H. ruficola*, under stones; *Cercyon unipunctatum*, *C. quisquilius*, and *Aphodius merdarius*, in *stercore bovino*; *Aleochara nitida* and *v. bilineata*, *Cafius fuscicola*, *C. xantholoma*, *Homalium rivulare*, and *H. laviusculum* in seaweed; on patches of *Honkenya peploides* were numbers of *Cassida nobilis* and *Coccinella 11-punctata*, also a few *Anthicus scoticus*; sitting on a thistle-head I got one *Hylobius abietis*, and Mrs. Johnson picked up *Otiorhynchus atroapterus* among the herbage above tide-mark.

We had one day at Bellurgan, where, besides most of those mentioned above as occurring on the Carlingford and Greenore shores, we took *Anisodactylus binotatus*, *Lathrobium multipunctatum*, *Oxytelus laqueatus*, and *Geotrupes stercorarius*. I do not imagine that Mrs. Johnson and I at all worked out the locality, and I fancy it would quite repay another visit. Any Coleopterist who wants to find "fresh fields and pastures new," could not do better than run across to Greenore by the L. & N. W. R. Steamer from Holyhead. There is a capital hotel there, and very comfortable lodgings can be had in Carlingford; I shall be glad to give any information in my power to any Coleopterist wishing to try the locality.—W. F. JOHNSON, Winder Terrace, Armagh: October 6th, 1888.

Reviews.

ENTOMOLOGY FOR BEGINNERS; for the use of young folks, fruit growers, farmers, and gardeners. By A. S. PACKARD, M.D., Ph.D. 8vo, pp. 367. New York: Henry Holt and Co. 1888.

We commend this book to the notice of British Entomologists as the best of its kind in the English language. Intended primarily for American readers, it may be

studied with advantage on this side of the Atlantic, and is a *multum in parvo* of information. About the first third is occupied by lucid details of external and internal anatomy, physiology, &c. The "beginner" may, of course, skip this if he please, but he will learn much by steadily going through it: then follow Classification, Insect Architecture and Economic Entomology. Finally, copious directions for collecting, rearing, preservation, microscopic dissecting and mounting, &c., &c., and a Glossary. The book is profusely illustrated, but we think we recognise most of the figures as already familiar to us. Original illustrations would have greatly enhanced the cost.

Some will say the subject is sometimes treated in too abstruse a manner for a beginner. There are beginners who never aspire to be more than collectors; there are others who wish to be students as well as collectors. Dr. Packard probably addresses himself to these latter in particular.

The systematic arrangement will strike some as peculiar. At the present time each writer on classification of any note has his own special views on this point. Our author has his. On a point so controversial we prefer to leave the reader to judge, warning him not to pin his faith to any system, simply because an author of ability puts it forward as his own.

The work is so generally good that we refrain from adverse criticism on minor details, or occasionally on what seem to be errors of omission. If there be a fault (in the eyes of a "stranger") it is the prominence given by the author to his own papers in the bibliographical lists.

"Entomology for Beginners" is a handy text book brought down to date, or, occasionally perhaps, a little in anticipation of date.

THE ORIGIN OF FLORAL STRUCTURES THROUGH INSECT AND OTHER AGENCIES. By the Rev. GEO. HENSLOW, M.A., F.L.S., F.G.S., Professor of Botany, Queen's College, and Lecturer to St. Bartholomew's Hospital Medical School. pp. i—xi, and 1—349, with 88 illustrations. 8vo. London: Kegan Paul, Trench & Co. 1888.

This work, which forms the 63rd volume of the publishers' "International Scientific Series," is primarily of interest to Botanists, and is, in a scarcely less degree, interesting to Entomologists. In the preface, after glancing at the theories and speculations of authors on the influences which induce plants to vary in response to them, whereby adaptive morphological (including anatomical) structures are brought into existence, specially citing Geoffroy Saint Hilaire (1795), Lamarck, Patrick Matthew, the author of the "Vestiges of Creation," Herbert Spencer, Darwin, A. R. Wallace, Dr. C. Sempér, Dr. A. de Bary and Dr. Vines, the author says:—"I have attempted in the present work to return to 1795, and to revive the 'Monde ambiant' of Geoffroy Saint Hilaire, as the primal cause of change. My object is to endeavour to refer every part of the structures of flowers to some one or more definite causes arising from the environment taken in its widest sense. To some extent the attempt must be regarded as speculative; and, therefore, any deductive or *à priori* reasonings met with must be considered by the reader as being suggestive only."

The continuity of the argument, and the interdependence of its propositions, preclude giving extracts in elucidation, but we cite a few as examples of the style in which the subject is treated.

Page 147. "The common or physical basis of vegetable life, namely protoplasm, is very nearly indistinguishable in its properties from that of animals. Their behaviour is every day being proved to be not only similar but identical in the two kingdoms. The effects, under mechanical irritations and strains, of nutritive matters of the same kind, of poisonous substances, of electricity, &c., all show that the bond which unites the animal and vegetable kingdoms together is of one and the same nature, and that the links of the chain are forged out of this common basis of life.

"It is not to be wondered at, then, but rather to be anticipated, that tissues will behave alike in both kingdoms; that organs will grow with use and degenerate with disuse; that they will develop processes to meet strains put upon them, as the limbs of animals have done, and as stems will do by forming special tissues; and, on the other hand, that they will atrophy if not called upon to display their powers, as parasitic organisms abundantly show in both kingdoms; and as plants degenerate in water, which saves them the trouble of supporting themselves.

"All this is exactly what one finds to be the case in every department of the animal and vegetable kingdoms alike, whenever we search diligently into the anatomy and meaning of the histological details of all parts of organisms."

Page 151. "Having now stated on what grounds I believe that the cohesions and adhesions between them, as well as the forms of floral structure have arisen—namely, in response to the irritations set up mainly by insect agencies, coupled with the effects of nutrition, atrophy, hereditary influences, &c.,—it will be desirable to show briefly, not only how remarkably sensitive almost all parts, both vegetative and reproductive, are to the action of stimuli, but how they exhibit even visibly responsive effects, both in protoplasm of the cells and in the tissues which are composed of them."

Page 157. "A small swelling appears on the tigellum of *Myrmecodium*, serving the purpose of a reservoir of water, but which only grows larger through the agency of ants. These creatures induce hypertrophy of the cellular tissue. This, then, becomes hereditary. I would venture to go further, and attribute the honey-pits at the base of the leaf-stalk on *Acacia sphærocephala*, as well as the terminal 'fruit-bodies' occurring on the tips of the leaflets, to the same cause, viz., the mechanical irritation of the ants.

"There is, in fact, an abundance of evidence to prove that many organs of a plant, if subjected to irritation, can respond to it, and not only increase in size by hypertrophy, but materially alter their anatomical structure and develop new processes. Secondly, that these altered states, if the irritation be persisted in, may become hereditary."

Page 178. "From the preceding remarks it will now be gathered that colours, *per se*, are a result of nutrition; and that the prevalence of brighter colours in conspicuous flowers which are regularly visited by insects is due to the stimulating effects which they have produced, thereby causing more nutritive fluids to pour into the attractive organs.

"Besides, however, this general result of brilliant colouring, there are those peculiar and special displays of bright tints distributed in spots and streaks in certain and definite places only. These have been called 'guides' and 'path-finders,'

as they invariably lead to the nectaries. If the theory be true which I am endeavouring to maintain throughout this book, all these effects are simply the direct results of the insects themselves. The guides, like obstructing tangles of hair and nectaries, are always exactly where the irritation would be set up; and I take them to be one result of a more localized flow of nutriment to the positions in question.

"Instead, therefore, of a flower having first painted a petal with a golden streak to invite the insect, and to show it the right way of entering, the first insect visitors themselves induced the flower to do it, and so benefited all future comers."

We are all familiar with the subject of fertilization of flowers by insect agency, but this work opens out a virtually new view of the functions and the importance of insects in the scheme of life, as the actual originators of flowers and the producers not only of the infinite variety of their form, but even of colour. This adds a new charm to the observation of insect-life, and the study of it with special reference to the theory now propounded, cannot fail to elicit and accumulate many additional facts in support of it.

A LIST OF BRITISH DIPTERA. By G. H. VERRALL, F.E.S. 31-pp. small 4to. London: Pratt & Co. 1888.

This List comes upon us by surprise; but it is a welcome surprise. The compiler says, "I am aiming mainly to find out what I and others possess as true British species, so as to enable me, or some one else, soon to publish a fairly authentic list of British *Diptera*." This extract from the short preface sufficiently indicates the tentative nature of the List, and the species not fully understood by the compiler, or requiring confirmation as British, are printed in italics. A rough estimate made by us gives the number of species listed at about 2500; there should not be much difficulty in raising the number to 3000. We echo the wish expressed in the preface, to the effect that the publication of this List may soon render a second edition necessary. At present Mr. Verrall claims the indulgence of criticism by British entomologists only. It is a good beginning by a competent and conscientious hand.

ENTOMOLOGICAL SOCIETY OF LONDON: Oct. 3rd, 1888.—Dr. D. SHARP, F.L.S., President, in the Chair.

Mr. F. P. Pascoe exhibited a number of new species of *Longicornia* from Sumatra, Madagascar, and South Africa.

Dr. P. B. Mason exhibited, for Mr. Harris, a specimen of *Chærocampa nerii*, recently captured at Burton-on-Trent.

Mr. S. Stevens exhibited a specimen of *Vanessa Antiopa*, which he caught in the Isle of Wight in August last. Mr. Stevens asked whether Mr. Poulton or any one else present could inform him why, in British specimens of this species, the border of the wings was almost invariably a pale straw-colour. A discussion ensued, in which Mr. F. D. Godman, Mr. McLachlan, Mr. Kirby, and Dr. Mason took part.

Mr. E. B. Poulton exhibited a living larva of *Smerinthus ocellatus* in the last stage, fourteen larvæ of *Boarmia roboraria* and some cocoons of *Rumia cratægata*. The object of the exhibition was to show the influence of special food-plants and surroundings on the colour of the larvæ and cocoons.

Mr. M. Jacoby exhibited a varied series of *Titubæa sanguinipennis*, Lac., from Central America. He stated that many of the varieties exhibited had been described as distinct species.

Mr. Billups exhibited specimens of *Bracon brevicornis*, Wesm., bred from larvæ of *Ephestia Kühniella*. He remarked that this rare species had only been recorded as bred on two or three occasions, viz., by the Rev. T. A. Marshall, Mr. W. F. Kirby, Herr Brischke, and Mr. Sydney Webb.

Mr. W. Warren exhibited specimens of *Antithesia ustulana* and *A. fuligana*; also bred series of the following species:—*Eupacilia Degreyana*, *Stigmonota pallifrontana*, *Cacæcia decretana*, and *Gelechia peliella*.

Lord Walsingham exhibited several species of the genus *Cryptophasa* belonging to the family *Cryptolechidæ* of the Tineina, some of the most remarkable being males and females of *Zitua balteata*, Walker, bred by Mr. Sidney Olliff from pupæ found in January last, at Newcastle, New South Wales, in burrows in branches of a species of *Acacia*. Also a male of *Zelotypia Stacyi*, received from Mr. Olliff.

Mr. F. D. Godman exhibited a larva of a *Cicada*, from Mexico, having a fungoid growth on the head.

Mr. H. J. Elwes exhibited a large number of butterflies, representing about 108 species, recently collected by himself and Mr. Godman in California and Yellowstone Park. The collection included many species of great interest, amongst others a species described by Mr. W. H. Edwards as *Erebia Haydenii*, but which he considered would prove to be a *Cænonympha*; a very rare species of *Thecla*; and a remarkable series of species of the genus *Colias*.

Mr. H. Goss exhibited, for Mr. W. J. Cross, an extraordinary melanic variety of *Agrotis segetum*, caught by the latter near Ely, in July last.

Mr. W. L. Distant read a paper, entitled "An enumeration of the *Rhynchota*, received from Baron von Müller, and collected by Mr. Sayer in New Guinea during Mr. Cuthbertson's expedition."

Mr. Poulton read a paper entitled "Notes in 1887 upon Lepidopterous larvæ, including a complete account of the life-history of *Sphinx convolvuli* and *Agria tau*;" and Mr. White exhibited specimens of preserved larvæ of *S. convolvuli*, *A. tau*, and other species referred to in Mr. Poulton's paper. Mr. Jenner Weir, Mr. Kirby, Mr. White, Dr. Sharp, and others took part in the discussion which ensued.—
H. Goss, Hon. Secretary.

THE HABITS OF *OPOSTEGA SALACIELLA*, TR., &c.

BY W. WARREN, M.A., F.E.S.

I am glad to be able to record the accidental breeding of *O. salaciella*, Tr., and the name of its probable food-plant. In a bag containing the roots and plants of *Rumex acetosella*, from which I was breeding *Gelechia peliella*, Tr., I found in July a single specimen of *salaciella*, just emerged, and when the rubbish was subsequently turned out, a second dead and dried specimen of the same insect was discovered. No other plant besides the *Rumex* had been introduced into the bag, so that, I think, we may safely conclude that this is its food-plant; and it *probably* feeds among the flowers or in the flower-stalk. For having observed that the *peliella* larvæ were in the habit of emerging at night from their silken tubes at the base of the plants, and spinning fine threads up the stems to the flower-heads on which they fed, I replenished the original stock of food with a bunch of fresh flower-stems, and I think it most probable that in these last the *salaciella* larvæ were hidden. The plant grows freely in all the localities where the perfect insect is usually met with. It may be useful to English Micro-Lepidopterists to briefly mention here what little is known of the habits, and more especially of the larval state, of the other species of the genus.

O. (Bohemannia), Stn., Proc. Ent. Soc. Lond., ser. 2, iii, p. 18) *quadrimaculella*, Boh., which seems to me to belong here, is certainly addicted to alders, and the larvæ will be probably found to feed in the flowers or flower-stalks in spring.

O. spatulella, H.-S., said to frequent elms, and also to hibernate in the imago state (*cf.* Stn., Ent. Mo. Mag., 1877, vol. xiv, p. 140), possibly feeds within the elm (wych elm?) flowers and seeds, or the flower-stalks.

O. auritella, H., which seems to be very rare, if, indeed, the *real auritella* has ever been taken, in England, is stated to have been once bred accidentally by Knaack, at Stettin, from a stem of *Caltha palustris*. According to Büttner, the larva is active, pale green in colour, pupating in a rather strong white cocoon. The imago should be out in vi, vii, in marshy places. It is recorded from Lebus (Frankfort-on-the-Oder), on thistles (Zeller); from Potsdam, in large numbers, among *Lycopus europæus* (gypsywort) (Hinneberg).

O. crepusculella, Z.: "Larva probably on *Mentha*." This is, I think, a very likely suggestion: where *crepusculella* flies commonly in Wicken Fen, *Mentha palustris* is abundant.

The remarks on the last two species are taken from Sorhagen's *Kleinschmetterlinge der Mark Brandenburg*, p. 301. The same writer, also, quoting Hinneberg, says of *salaciella* that it flies in dry spots, not uncommonly, round Potsdam among *Achillea*, and adds, that it occurs singly from v to vii, in dry fir and birchwoods, concealing itself by day in the grass, and only showing itself towards evening. And of *O. reliquella*, which Dr. Wocke considers to be merely a variety of *salaciella*, he states that it occurs among aspens.

13, Cheyne Row, Chelsea, S.W. :

October 15th, 1888.

RETINIA POSTICANA, ZETT., A NEW BRITISH *TORTRIX*.

BY W. WARREN, M.A., F.E.S.

The first week in June I captured, among young Scotch firs near Cambridge, a pair of what, though I had neither seen the species, or heard of its occurrence, in that neighbourhood, I too hastily assumed to be *turionella*, L. Being smaller and duller in colour, I did not trouble about more at the time, merely making a mental note to look for the larvæ next spring. But lately, when I was placing a freshly-bred *turionella* in my series, and comparing them with the above two caught specimens, I became aware that these latter were altogether different, and on further examination they proved to be *R. posticana*, Zett., Ins. Lap., p. 982. They are, as far as I can see, identical with our so-called Scotch *duplana*, which Mr. Barrett has hitherto considered, and still considers, to be a dwarfed, dark form of *turionella*, L. In the general collection of the British Museum there are six specimens of *R. duplana*, Hb., all of them from Germany; the first four from the late Herrich-Schäffer, the last two from Dr. Staudinger. There is no example of *posticana*, Zett.; but a poor specimen of the Scotch insect is to be seen in Stephens' Cabinet. The species was originally taken in Inverness-shire, by Mr. Bouchard; two years ago it was met with in good condition by Mr. A. H. Jones, near Rannoch, and this season again by Mr. T. W. Salvage.

For comparison, I give a brief description of the true *duplana*, Hb., and the present species:—

Duplana, Hb., is distinguished by its *oblique* hind-margin, and, consequently, more prominent and sharper apex; its *grey* thorax (the head only being rusty); and the coalition of its transverse lines into four more or less evident fasciæ.

Posticana, Zett., which is of about the same size as *duplana*, Hb., has the hind-margin less oblique, more curved; the apex less prominent; and *both the head and thorax* rusty; the basal two-thirds being more or less obscurely dark, and the apical one-third rust coloured.

From *turionella*, L., they may *both* be separated at once by their much smaller size, and by the colour of the *hind-wings*, which, in *turionella*, L., are silky whitish, darker only towards the hind-margin, in the other two entirely dark grey in both sexes.

Of *posticana*, I append a more detailed description:—

Expanse of wings, 12—16½ mm. Antennæ grey-brown. Palpi grey beneath, above rust coloured, like the head; thorax the same, more greyish behind. Legs greyish-yellow, with pale-ringed tarsi. Abdomen ashy-grey, the last segment yellowish. Fore-wings dull leaden-grey, with lighter ashy-grey, slightly lustrous, transverse lines, which, in the most clearly marked examples, form a paler transverse fascia just beyond the base, and a broad one just before the middle, which latter is always traversed by a fine dark line down its centre. Apex, to a moderate extent, rusty-brown, which tint also extends along the hind-margin to the anal angle, and is traversed towards the costa by two or three whitish-grey abbreviated transverse lines; fringes dark grey. Hind-wings in both sexes alike, brownish-grey, not paler towards the base.

Under-side brownish-grey, the fore-wing rather deeper than the hind-wings; on the costa before the apex are four yellowish spots, the outermost of which is divided by a dark streak.

The above description is in the main taken from Wocke's account in the *Stettiner Entomologische Zeitung*, for 1862, pp. 50, 51. The synonymy, as given by Wocke, in the Catalogue, is as follows:—

Posticana, Zett., Ins. Lap., p. 982; Wo., S. E. Z., 1862, p. 50; Hein., p. 94.

Sylvestrana, Hein., p. 95.

Mulsantiana, Rtz., S. E. Z., 1848, p. 266 (larva).

To these must be added:—

Posticana, H.-S., Corr. Bl. Zool. Min. Ver., 1863, p. 121; De Graaf, Tijds. v. Ent., 1869, p. 204; Snell., Microp., p. 257.

Duplana, Wilk., p. 221; Stn., Man., 2, 248.

Turionella, var., Barrett, Ent. Mo. Mag., xxi, p. 126.

It should be noted that Wilkinson's description of the hind-wings agrees neither with *duplana* nor *posticana*, and would seem to have been made from a small *turionella*. The larva, like that of *turionella*, is said to be full-fed in March, in the young shoots of *Pinus sylvestris*.

NOTES ON BRITISH *HEMIPTERA*—THE BRITISH SPECIES OF
SCOLOPOSTETHUS, &c.

BY EDWARD SAUNDERS, F.L.S.

I have lately (through Mr. J. Eardly-Mason, of Alford, and Mr. C. O. Waterhouse) had my attention especially called to this genus, and I have accordingly captured a great number of specimens of its various forms, and I propose here to offer a few remarks upon them.

I must own that until this year I have always believed our so-called species to be only varieties of each other, and this belief has not yet entirely passed away, and in accordance with this view I fear that my investigation of the distinguishing characters claimed for them by more careful observers was very superficial; this has had for its result that I failed to notice an apparently good structural character, mentioned by all our continental Hemipterists, and by Mr. Douglas in Ent. Mo. Mag., xi, 265; but on having my attention called to it by Mr. Waterhouse, I at once set to work to collect materials, to see if, by its help, I could get to a better understanding of our so-called species.

The character I allude to is the presence in some individuals of tubercles in front of the intermediate coxæ. These are very prominent in certain of the males, being long and curved, and are clearly present, although often reduced to mere points, in certain of the females.

It seems to me that the presence of these tubercles gives a fairly good reason for separating their owners from those which do not possess them.

On this point Mr. Douglas makes some remarks in Ent. Mo. Mag., xi, 265. He there considers that the presence or absence of these tubercles is correlated with the development or non-development of the wings. Here I fail to agree with him, as I have macropterous and brachypterous specimens with tubercles, and macropterous and brachypterous specimens without tubercles, and I therefore think that whether we allow these tubercles as a character of specific value or not, we must acknowledge that they are not dependent on alar development.

Up to the present it has been considered that we have four species, *pictus*, Schill., *adjunctus*, D. & S., *affinis*, Schill., and *decoratus*, Hahn. Of these we may dismiss *pictus*, as it is easily recognised (whether specifically distinct or not) by its larger size, brighter colouring, and long, thin, entirely pale antennæ; being very rare, it is not easy to get together any number of specimens whereby to test its variability, but all I have seen show very little tendency to vary.

Between the other three I fail to detect any distinguishing struc-

tural character, except the mesosternal tubercles and the slightly shorter thicker 2nd joint of the antennæ in the untuberculated form. I cannot see any character worth relying on by which to make two species out of the untuberculated form. What is generally known as *decoratus*, Hahn., = *ericetorum*, Leth., has the antennæ darker, occurs on *Erica*, &c., and is only known in the macropterous form; untuberculated specimens, however, both developed and undeveloped, are taken on nettles, the developed ones agreeing exactly with *decoratus*, and the undeveloped ones differing only in the lighter colour of the base of the 2nd joint of the antennæ, which is pale for at least two-thirds of its length, with a very distinct black apex.

On the continent the four species are also recognised, but Drs. Puton, Horváth and Reuter have considered *adjunctus*, D. & S., to be the untuberculated species, whereas, it is the developed form of the tuberculated one. In a letter recently received from Dr. Puton he expresses a doubt as to the distinctness of what he calls *adjunctus* (nec D. & S.) from *decoratus*, and so I have little doubt that we shall be right in reducing the number of our British species at most to three, namely:—

pictus, Schill.

affinis, Schill.

decoratus, Hahn.

var. ericetorum, Leth.

Pilosus, Reut., a species easily recognised by the long hairs on the pronotum and hemelytra, has not yet been recorded from our country, but it probably will be added to our list some day, as it appears to have a wide continental range.

I have not attempted here to unravel the complicated synonymy of these various species, but have taken it for granted that Schilling's *affinis* is the tuberculated form. Should it prove to be otherwise, then *adjunctus*, D. & S., will stand for what I here call *affinis*, Schill.

Ischnocoris angustulus, Boh.—Dr. Reuter suggested to me in a letter recently received that it was possible that our British *Ischnocoris* would prove to be *angustulus*, Boh., and not the true *hemipterus*, Schill. On examining my specimens with the descriptions of the two species, I see at once that he is right; *hemipterus*, Auct., is a narrower, more brightly coloured species, and has the 2nd antennal joint entirely red. I have macropterous and brachypterous specimens of both species; *hemipterus* seems to be a species of more southern distribution. I have it from Switzerland and Greece. Both species appear to frequent similar localities, and personally I feel somewhat similar doubts as to their specific distinction, as I do regarding the species of *Scolopostethus*.

NOTES ON SOME BRITISH AND EXOTIC *COCCIDÆ* (No. 12).

BY J. W. DOUGLAS, F.E.S.

COCCUS AGAVIUM, *n. sp.*

Fig. 2.



Fig. 1.



Fig. 4.



Fig. 3.

♀ adult; short rounded-oval, a little narrower in front (Fig. 1), smooth, without mealy or cottony covering, very convex and firm on upper-side, pinky-yellowish, with some light brown specks on the back, somewhat in two longitudinal rows; beneath soft and very tumid; segmentation visible above and beneath; no anal ring, process or hairs. Legs short, much imbedded in the pulpy body; tibiæ short, tarsi fully as long, claws short; hairs simple. Antennæ (Fig. 2) short, stout, tapering, of seven joints; the 1st longest, 2nd, 3rd and 4th nearly as long, sub-equal, 5th, 6th and 7th each consecutively shorter and smaller, and having a few hairs. After full gestation the insect becomes covered with loose cottony material copiously exuded from its body, under this the ovoviparous parturition takes place, as stated below.

Length, 2—3 mm.

♂ blackish-brown, shining; head broadly produced anteriorly; antennæ (Fig. 3) long, slender, piceous, with projecting simple hairs; of ten joints, the first two thick, 1st shortest of all, narrow at base; 2nd oval, twice as long as the 1st; 3rd to 5th thinnest, 3rd longest of all; 4th and 5th one-fourth shorter, sub-equal; 6th to 10th stouter, 6th as long as 2nd; 7th shorter; 8th and 9th still shorter, sub-equal; 10th shorter than 9th, conical. Eyes simple, an ocellus vertical and close to the margin of each. Thorax broad, convex, sides divergent to an angle, posterior angles prominent; posterior depression large. Wings very long, ample, clear white; halteres short, white. Terminal filaments of the body long, white. Legs (Fig. 4) long, slender, piceous, with short, projecting, simple hairs; tibiæ very long; tarsi one-fourth as long as the tibiæ, claws very short. Pupa in a close fitting sac made by the larva.

Length, 1 mm.

This species, by having only the (in the *Coccina*) anomalous number of seven joints in the antennæ of the female and ten joints in the antennæ of the male, comes well into the genus *Coccus* as defined and restricted in these respects by Signoret (Ess. Cochen., p. 380), of which only one species (*C. cacti*, Linn.) has hitherto been described; but from it the present species, except in the two points mentioned, conspicuously differs. At one time I thought it might constitute the

type of a new genus, under the name of *Gymnococcus*, but in consideration of the important and leading characters of the antennæ, I have concluded (for the present, at least) that it is better to regard all the others as specific, and to refer the species to Signoret's genus *Coccus*.

In February last I received from Mr. D. Morris, Assistant Director of the Royal Gardens, Kew, a quantity of white cottony matter that had been collected from the under-side of leaves of a species of *Agave*, which came three years previously from one of the Southern States of North America. This mass contained many of the females of the above mentioned *Coccus*, by which it had been produced; they were not attached to it, but on its removal they, by reason of their rotundity, rolled readily about, apparently without life. Having gummed some of them back downwards on to a card, I soon saw that they were not dead, but were in the act of extruding apparently living larvæ, but on observing them more closely in the microscope, under a half-inch objective, I witnessed some long-oval yellow eggs excluded, from which, while in the very act of parturition, a larva escaped, so that generation is ovoviviparous; several of the larvæ, as they appeared, clung together; when all were excluded, the body of the mother collapsed entirely. About a month later I obtained from Kew part of a leaf of the *Agave*, with the *Cocci* stationary *in situ* under the cotton which they had exuded, sometimes three or four under one mass. I also found, mostly on the outside of these masses, small white cocoon-like sacs, each either empty or containing a dead pupa of the male, or in a few only a dead male imago; and although there were many of these sacs, not one had a living male in it, nor were there any living males free.

The illustrative figures are photographically rendered from drawings kindly made with camera lucida by Mr. G. S. Saunders.

On October 16th, Mr. S. J. McIntire, Shepherd's Bush, sent to me some leaves of an orchid and mango tree which he had just received from the Royal Botanic Gardens, George Town, Demerara, each leaf having attached to it scales of *Coccidæ*. On the mango only were scales of *Ischnaspis filiformis*, Doug. (*cf.* Ent. Mo. Mag., xxiv, p. 21), of which the native country was not previously known; and patches of the white carinate scales of the male of a *Diaspis* or *Chionaspis*, of which nothing more could be determined, there being no female scales; Signoret notes that he had found some similar which he did not recognise. On both kinds of leaves were the scales

of *Lecanium acuminatum*, Sign. (of which more hereafter); and on both also, in all stages of development, the still more interesting scales of the following species.

VINSONIA STELLIFERA.

Coccus stellifer, Westw., Trans. Ent. Soc. Lond., 1871, Proceed., p. 3.

Vinsonia pulchella, Sign., Ess. Cochen., p. 190, pl. vii, fig. 7.

This "magnifique espèce," as Signoret calls it, one of the most remarkable of all the many singular forms of scales of the *Coccidæ*, has been separated generically by him, under the name of *Vinsonia*, and placed next to *Ceroplastes*, as being one of the species masked with a waxen covering. He says:—

"The pellicle which covers the insect is thin, of waxen appearance, corneous, transparent, forming on its disc a testudinate marquetry, and on each side radiating arms to the number of seven, of which one corresponds to the head and the others to the stigmata, there is also a very short one at the anus. We know only the female, which has the form of a star, the branches in all their extent covering the vacant space which forms the stigmatiferous tube, observable in all the *Lecanidæ*. At a more advanced age the secretion encroaches on the vacant space between the branches of the star, which then appear to be united by a membrane. The dorsal disc is convex, semi-globose. The secretion being removed, and then a corneous skin, the insect is seen beneath it, of a rounded oval form, a little narrowed towards the head, blackish in colour, with a quantity of embryonic larvæ or eggs beneath it. The antennæ have six joints, the 1st very broad, the 3rd longest, equal to the last three together, the 6th longer than the two preceding it."

To this very good description of the female, perfectly applicable to the scales now before me, it need only be added, that the dimensions vary, according to age, from $\frac{1}{2}$ to 3 mm., measured transversely from the point of one ray to the point of another; that in the ultimate condition the white waxen covering has disappeared from the round, convex, brown centre, and that the rays are shortened by more than half their length. Signoret obtained specimens from mango trees in Réunion and orchids in plant stoves in Paris.

In the "Transactions of the Entomological Society" for 1871 (7. c.), in the report of the meeting on February 6th of that year, is a brief description by Professor Westwood of *Coccus stellifer*, a new species infesting the leaves of the orchid *Cypripedium niveum* from Siam. This description Signoret recognised (Ann. Soc. Ent. France, 1876, p. 608) as that of his *Vinsonia pulchella*, but although he had figured the species, and it was published in the "Annales" in 1870, pl. 8, fig. 7, there was no name or description with it, and these did not appear until 1872 in the "Annales" for that year, pp. 33 and 34,

his paper having been read at the meeting of the Society on Feb. 14th, 1872; thus Westwood's specific name has priority. It is curious that Westwood had only male scales, and Signoret only those of the female; among those that I have I cannot determine any of the male. When Signoret says the scale has the form of a star, which is also implied by Westwood's *stellifer*, reference is intended to the "star" of an Order of rank and merit. Mr. McIntire aptly says, "the scales resemble tiny tents pegged down in six or seven places."

8, Beaufort Gardens, Lewisham :

October, 1888.

ON THE VARIATION OF THE APICAL VEINS IN THE GENUS *CEROSTOMA*, LATR., AND ITS ALLIES.

BY THE RT. HON. LORD WALSINGHAM, M.A., F.R.S.

In endeavouring to separate the North American species of *Cerostoma*, Latr., according to the system adopted by Herr Pastor Wallengren,* my attention has been called to the characteristics of the four genera† into which the author divides the species included in Staudinger's and Wocke's Catalogue under the single name *Cerostoma*, Latr. The distinctions upon which these genera are founded have reference first to the outline of the wing; secondly, to the neurulation; and thirdly, to the presence or absence of ocelli. The tufts of raised scales on the wings of three species are also especially noticed.

The falcate apex of the fore-wing in *C. falcella*; *C. nemorella*, and *C. xylostella*, which species he places in his new genus *Periclymenobius* is of itself a strong and perhaps sufficient character to be regarded as of generic value.

The raised scales on the fore-wings of *C. asperella*, *C. horridella*, and *C. scabrella*, which are placed in the genus *Trachoma*, are not found in his three allied genera; but when we come to the groups of species, placed respectively in *Cerostoma*, Latr., and *Credemnon*, Wlgrn., the differences on which Wallengren relies for separating them do not appear to justify this further sub-division.

Apart from the question of the presence or absence of ocelli, the only distinction to which he appears to attach importance is the length of the fascicule, or tuft of scales, projecting from the second joint of the palpi, which in *Cerostoma* is "shorter than, or only equal to, the

* Skandinavians arter af Tineidgruppen *Plutellidæ* Staint—Ent. Tidsk., i, 53—63 (1880).

† *Cerostoma*, Latr., *Credemnon*, Wlgrn., *Periclymenobius*, Wlgrn., and *Trachoma*, Wlgrn.

length of the ultimate joint," whereas, in *Credemnon*, is said to be "longer than" that joint.

In *Cerostoma* the ocelli are present, in *Credemnon* they are said to be absent, as also in the allied genus *Periclymenobius*.

My assistant, Mr. Durrant, in examining the structure of some North American species, found that ocelli were present in all, and suspecting that Wallengren's observations on this point were incorrect, we carefully examined all the species mentioned in his paper. The result has been the discovery, that contrary to the statements of that author, ocelli are present not only in the genera *Cerostoma* and *Trachoma*, but in *Credemnon* and *Periclymenobius*, as well as in *Theristis*, where he had also failed to observe them.

In defining the genus *Credemnon*, Wallengren writes that the "carpal," or apical, vein of the fore-wings is "most often simple, rarely stalked." In this genus he places three species, *C. alpellum*, F., *C. lucellum*, F., and *C. sylvellum*, L. Of these I find the first two only have the apical vein usually simple, the last has it usually stalked. Under *Cerostoma*, of which he writes that the apical vein is "simple or forked," he tabulates four species, *C. sequellum*, L., *C. vittellum*, L., *C. radiatellum*, Don., and *C. parenthesesellum*, L. (= *costellum*, F.).

Of these I find the last two only have the apical vein usually stalked. It is thus evident that we cannot separate *Credemnon* on the ground of neurulation, and after correcting the error as to the absence of ocelli, it seems impossible to attach generic value to the other distinguishing character claimed for it—"fringes of the fore-wings drawn out to a short point at the anal angle." Thus, after recognising *Trachoma*, Wlgrn., and *Periclymenobius*, Wlgrn., as possibly good and distinguishable genera, there remains a large group of species for which the lines of separation proposed by Wallengren are not sufficiently satisfactory. I first endeavoured to arrange these in two divisions according to the form of the apical vein of the fore-wings, and the attempt led to the critical examination of this character in a number of specimens. I was somewhat surprised to find that although not unfrequently regarded as of generic value, it cannot be relied upon as constant, if observed in few specimens only of each species, and that it is necessary to examine a considerable series to ascertain in each case what is the normal arrangement of the apical veins.

The following table will serve to illustrate this assertion. It shows the number of specimens of each species examined, and the varying positions of the apical and sub-apical veins of the fore-wings, as well as the proportion in which each variation occurs throughout the series :—

SPECIES.	Prominent Form.	No. of Specimens examined.	Λ	ΛΛ	Λ	∩Λ	∩Λ	∩
<i>Cerostoma sequella</i> , L.	∩	22	—	4	—	—	4	14
<i>vittella</i> , L.	Λ	33	5	4	14	1	3	6
<i>radiatella</i> , Don.	Λ	83	75	—	5	1	1	1
<i>parenthesella</i> , L.	Λ	48	34	4	3	3	2	2
<i>sylvella</i> , L.	Λ	30	29	1	—	—	—	—
<i>alpella</i> , Schiff.	∩	21	—	1	2	3	—	15
<i>lucella</i> , F.	∩	6	—	—	—	—	—	6
<i>persicella</i> , Mn.	∩	8	—	1	—	1	—	6
<i>chazariella</i> , Mn.	∩	10	—	—	—	—	3	7
<i>Manniella</i> , Stgr.	Λ	2	2	—	—	—	—	—
<i>Trachoma horridella</i> , Tr.	∩	6	1	—	—	—	—	5
<i>scabrella</i> , L.	∩	7	1	1	1	—	—	4
<i>asperella</i> , L.	∩	16	1	1	2	1	2	9
<i>instabilella</i> , Mn.	Λ	11	6	—	—	—	—	5
<i>Periclymenobius nemorellus</i> , L.	Λ	7	7	—	—	—	—	—
<i>xylostellus</i> , L.	Λ	22	22	—	—	—	—	—
<i>falcellus</i> , Hüb ..	Λ	9	9	—	—	—	—	—

It will be seen at once how easily mistakes may be made in tabulating the species of *Cerostoma* by neural characters from an insufficient series, moreover, it is not difficult to overrate the importance of slight differences of neuration in determining the limits of genera, and perhaps of families or sub-families.

Here we find not only a few exceptional cases, but numerous instances, in at least six species of an accepted genus, in which the right and left fore-wings of the same specimen differ from each other in the arrangement of the apical veins.

In the face of such evidence, it is surely no longer safe to regard slight modifications of neuration, when observed in isolated specimens only, as conclusively establishing the proper classification of the species. Wrong as it would be wholly to neglect such evidence, it can be accepted only in conjunction with other corroborating characters, and after careful elimination of all possible sources of error.

Another question arises in connection with this subject, suggested perhaps, by some remarks of Mr. E. Meyrick in his paper "On the Classification of some Families of *Tineina*" (Trans. Ent. Soc., 1888, 119—131).

In cases where the two apical veins are variably forked, separate, or arising from a point in different specimens, or in opposite wings of a single specimen of one and the same species, it may probably be

reasoned that the species is in a state of progressive development. What is the direction of this development? Which is the older or more ancestral form? Does the multiplication or complication of wing veins, or the diminution of their numbers, and consequent simplification of structure, constitute the improvement aimed at in Nature? When the apical vein is forked, is it to be considered that the vein which should be separate and below it is partly anastomosed with it, or that its tendency is to become reduplicated so as to provide additional support to the delicate intervenal wing structure?

If we take *C. alpella*, *C. vittella*, and *C. sylvella*, we find their structure to be—*alpella* \sqsubset , *vittella* \prec , *sylvella* \nwarrow , which of these is the earlier form, and in what order should we place them?

In a few rare instances the lower of the two veins is found bent in the middle, as if endeavouring to approach the vein above it. I have found this to occur in a specimen of *C. scabrella* and *C. parenthesesella*—this certainly favours the theory of anastomosis; moreover, where the vein is forked, the stem of the \nwarrow often presents under the lens a reduplicated appearance, but it is difficult to comprehend what constitutes the advantage to the species in such a reduction of the number of wing-supports. Does simplicity of neuration conduce to strength, or would it not be more probable than an elaboration of structure should be regarded as progressive development?

It should be noted that in the diagram which accompanies this paper the form of neuration has been determined by touching the wings with benzine, and carefully examining them under a strong light. In doubtful cases the bases of the veins have frequently been denuded with a camel's hair brush. It may be taken for granted that in nearly all instances the form has been correctly determined, but the length of stem in forked veins is extremely variable; some are forked towards the apex, others so near the base as to make it difficult to decide whether the sign \nwarrow or \prec should rightly be used; the same observation applies as between the signs \prec and \sqsubset , but great care has been taken to avoid mistakes.

Occasional monstrosities are met with in which the apical veins are more or less distorted; these are very scarce, and not mentioned in the table given above. In one specimen of *Trachoma scabrella* a small supplementary cell was found at the upper extremity of the discal cell.

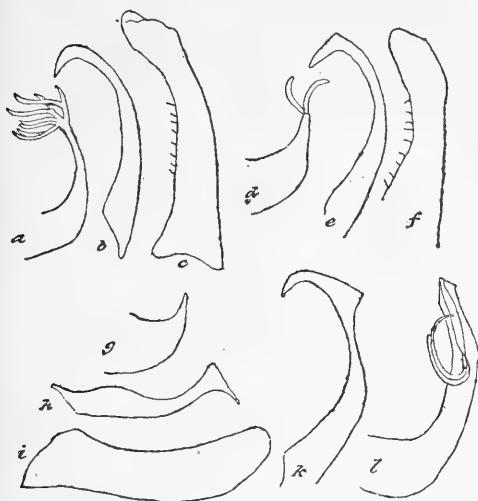
Merton Hall, Thetford:

October 22nd, 1888.

DESCRIPTIONS OF FOUR NEW SPECIES OF *TYPHLOCYBA*.

BY JAMES EDWARDS, F.E.S.

Our yellow or whitish species of *Typhlocyba* with the abdomen



entirely pale and the membrane at most faintly fuscohyaline, constitute a somewhat difficult group in which the structure of the male genitalia affords the best, and in some cases the only certain, characters for the discrimination of the species. In these small insects a mere external examination of the plates, pygofer, and anal tube, is of little use; but on dissection we find that the penis presents

great structural differences, which, from their undoubted constancy, are of the utmost value as specific characters. It is remarkable that Fieber overlooked this organ in his drawings of *Delphacidae* and descriptions of *Typhlocybidæ*, as it reaches its maximum of utility as a differential character in those groups.

TYPHLOCYBA HIPPOCASTANI, *n. sp.*

♂. Upper-side shining. Crown, pronotum and scutellum sordid yellow. Elytra whitish-hyaline, the corium strongly tinged with yellow from the inner margin to the sub-costal area, nerves of the membrane whitish, the stalk of the second apical area of normal length. Abdomen entirely yellow. Face, under-side and legs pale sordid yellow, claws black. Genitalia as figured (*a*, penis, *b*, style, *c*, plate); the four appendages of the penis, forming the lower group, are somewhat similar to those of *T. Lethierryi* (Ent. Mon. Mag., xvii, 224, *a*), but those of the upper group are totally different.

Found by Mr. Douglas commonly on the under-side of the leaves of horse-chestnut (*Æsculus hippocastanum*) in Beaufort Gardens, Lewisham, in October. I have dissected six males, not one of which shows any tendency to vary in the structure of the appendages of the penis.

TYPHLOCYBA AVELLANÆ, *n. sp.*

Crown, scutellum and pronotum dull whitish, the latter frequently tinged with yellow behind. Corium entirely yellow, the costa and inner margin, and generally

the nerves also, distinctly reddish in the male; the distribution of the yellow pigment is uniform in the female. Membrane hyaline, with a very faint fuscous tinge, nerves yellow. Abdomen yellow. Face, under-side and legs whitish, apical half of all the tarsi black in the male and frequently in the female also; this character is best seen on the under-side. Male genitalia as figured (*d*, penis, *e*, style, *f*, plate).

Taken by Mr. Douglas off the under-side of leaves of hazel (*Corylus avellana*) in his garden at Lewisham, in October.

TYPHLOCYBA OPACA, *n. sp.*

Upper-side dull. Crown, pronotum and scutellum white or yellowish-white. Elytra opaque-white, their basal two-thirds more or less strongly tinged with yellow from the inner margin almost to the costa; nerves of the membrane yellow, but difficult to see owing to its opacity, the second apical area not stalked in the male and but slightly so in the female. Face, under-side and legs pale yellowish-white, claws black. Abdomen entirely yellow. Male genitalia as figured (*g*, penis, *h*, style, *i*, plate).

Inhabits the under-side of the leaves of horse-chestnut in Beaufort Gardens, Lewisham. Several specimens from Mr. Douglas early in October. This species may be easily recognised by its dull appearance and opaque membrane; a useful character of secondary importance is the sessile second apical area. The male genitalia indicate in the simple penis, and in a less degree in the contour of the styles, an affinity with *T. Douglasi*, but in the latter species the styles are much larger and longer and bisinuate on their lower margin, a matter not made sufficiently plain in the engraving No. 1 on p. 248 of Vol. xiv of this Magazine; it is remarkable that the foot-shaped style should in both species be correlated with a penis devoid of appendages.

TYPHLOCYBA PRUNI, *n. sp.*

♂. White. Corium whitish-hyaline, membrane hyaline with a very faint fuscous tinge. Legs white. Genitalia as figured (*k*, style, *l*, penis, the point of one of the curved appendages of the latter was doubtless broken off in dissection).

One example from wild plum (*Prunus domestica*) near Norwich, September 23rd, 1888.

131, Rupert Street, Norwich :

November 1st, 1888.

Where does Gonepteryx rhamni hibernate?—I am greatly obliged to the Baron de Selys-Longchamps for his valuable reply to my question, for it proves almost conclusively that the colouring, marking and form of the wing of *G. rhamni* contribute to give protection during the months when the insect is hibernating. My difficulty was to find a situation in which such qualifications would be of any service, and the happy discovery of the insect actually resting among the leaves on the

surface of the earth, only shows once more that Nature does not waste her energies in producing forms that have no meaning. In sheltered woods and copses, not only do the leaves remain all the winter on the ground, but they often retain their varied colours until quite late in the spring.—GEO. H. KENRICK, Whetstone, Somerset Road, Edgbaston : *November 12th*, 1888.

Thecla w-album in Norfolk.—The *T. w-album* which has occurred at King's Lynn (*ante* p. 137) is not the first capture recorded for this county. I have in my possession an example taken at Stoke-Holy-Cross, near Norwich, on July 10th, 1881, and exhibited by Mr. Edwards at a meeting of the Norfolk and Norwich Naturalists' Society in that year. It was seen to fly from one of a group of tall elms and alight upon a thistle head, where it was netted. Although the spot was frequently visited in 1881 and following years, no second example was seen.—H. J. THOULESS, Cathedral Close, Norwich : *November 16th*, 1888.

Sphinx pinastri near Wimbledon.—I have to record the occurrence of what I believe to be *Sphinx pinastri* in this locality. The larva was found wandering about close to this house, some time between the end of August and the middle of September, 1887. I was told, on reaching home in the evening, that a strange looking hawk caterpillar had been found ; but, on the breeding cage being examined, it was not to be seen. Hence no particulars of its appearance are forthcoming, and I could not get a sufficiently definite description to enable me then to identify it. On the 16th July of this year the mystery was solved by the emergence of a good specimen of *pinastri*.—W. A. GODWIN, 1, Oak Villas, Church Lane, Merton, Surrey : *August 16th*, 1888.

[We have seen this example, and the determination is correct. Isolated cases of the occurrence of the species in England have of late years been several times recorded. There seems reason to believe that specimens recorded from near Ipswich may be considered as British (in the broad sense). Others (and we think the present is one of them) have probably resulted from imported eggs, larvæ, or pupæ. A full-fed larva that had escaped from confinement might wander for a considerable distance. An insect that is so abundant on the other side of the channel as to be considered injurious, should naturally occur here regularly. *S. pinastri* does not. A large quantity of eggs, larvæ and pupæ of *S. pinastri* are imported annually by dealers and others. The produce of some of these must escape. Everything tends to show that the insect is never, in any case, likely to be destructive here.—EDS.].

Crambus alpinellus in Norfolk.—I had been spending some hours, one day last month (August), in searching for *Agrotis cursoria* and *præcox*, and was pretty well tired from grubbing about among the *Ammophila*, when I was startled and aroused by the capture of a sharp little *Crambus*, which proved to be *alpinellus*. This was something to work for, and in half an hour I had secured two more. Then a thunderstorm, which had been visible at sea for an hour or more, broke, and drove me to the shelter of an overhanging bank. This was provoking enough, because of the probability that the storm would be followed by a cold breeze, and that the opportunity of obtaining more *alpinellus* was gone. However, it turned out differently. The cold breeze did not come, and although the *Ammophila* and other sand

plants were very wet, the moth apparently became more active, and before I was compelled by the approach of train time to drag my weary limbs to the nearest railway station, I had secured a score of specimens, several *C. latistrius* occurring along with them. Many dozens of *C. geniculeus* also were caught, and thrown away, for it was very hard to determine the species when on the wing, yet I think that *geniculeus* looked yellower when flying, *alpinellus* whiter, and the latter had a sharper, more lively flight.

As a rule one or two specimens of *alpinellus* in a season are all that can be reckoned upon on this coast, and some special influence must have been at work (apparently the thunder storm) to induce them to move so freely on this occasion. I spent many hours in looking for them on subsequent occasions, but met with one more only.

Since the time when Mr. Moncreaff used to take it rather freely near Portsmouth (on ground which has, I hear, since been occupied), very few captures have been recorded. Casual specimens have been taken at Yarmouth, and elsewhere on the coast, but it is still very scarce.

When the rain comes on or a cold wind blows, so that the few insects frequenting them will not move, these coast sands are very desolate. Perhaps the most interesting objects then to be found are the pretty varieties of *Helix virgata* (some very large), brown, pure white, rayed, or with the band waved.—CHAS. G. BARRETT, King's Lynn, Norfolk: *September, 1888.*

Plusia ni at Portland.—I have recently had the pleasure of examining a very rare British moth, a genuine specimen of *Plusia ni*, Hb. I found it among some *Noctuæ* sent for examination by Major Partridge, of The Castle, Portland. He says, "one night in September I had been out sugaring, and while passing down the terrace in my garden, which is within a few yards of the sea, an insect flew down to my light and fell to the ground. On examining it I at once saw that I had got something out of the common way. It looked uncommonly like *P. ni*, but I feared it was too good to be true." The specimen is a very perfect *Plusia ni*, and a most satisfactory confirmation of the title of the species to be included in the British list. As *Plusia ni* must now be fully admitted to rank as a British species, a few words upon the characters which distinguish it from the closely allied species may be useful. It is most nearly related to *P. gamma*, but smaller, hardly so large as *P. interrogationis*. It is a somewhat paler, greyer insect than either; the y-mark is entire and straighter than in *gamma*, that is, not so curved upwards, and the sub-terminal line is much indented and rather indistinct, but has several black wedge-shape streaks springing from it, and pointing towards the base of the wing. The small tufts of scales at the sides of the abdomen are yellowish.—ID.: *Nov. 12th, 1888.*

Tortrix piceana, L., in Surrey.—It may be of interest, as supplementing Mr. C. G. Barrett's note on this species (*ante* p. 139), to put on record recent captures that have come under my notice. A single specimen was taken on the wing in the neighbourhood of Esher, Surrey, in 1885. One was bred from a larva found feeding in united needles of *Pinus sylvestris* in the following year; and one other has been captured, and another bred since, from the same locality.—ROBERT ADKIN, Lewisham: *November, 1888.*

Arctia caja.—I am drawing and colouring plates of varieties of the above. My own small stock is exhausted. If any of your readers would kindly lend me any striking forms for the above purpose, I should be greatly obliged. Every possible care would be taken of them, and of course all expenses paid.—J. GREENE, Rostrevor, Clifton, Bristol: November, 1888.

Melanism in Boarmia repandata.—This season I bred seven or eight specimens of a form of *Boarmia repandata*, which, so far as I have been able to ascertain, has not been recorded before. The specimens are almost absolutely inky-black, blacker, indeed (when placed side by side), than the well-known black form of *Amphidasis betularia*. I found the form rather commonly in a fir wood near this town in 1887, the larvæ having evidently fed on the undergrowth of bilberry; but as the specimens were mostly worn, I reserved several of the females to obtain eggs, and was much more than repaid for the trouble expended on wintering the larvæ, when the imagines appeared this year. A dark form, known, I believe, as the variety *destrigaria*, is not uncommon, in some both northern and southern localities, but that form always has a strong brown tinge, which, in my specimens, is totally absent; in one or two specimens I bred, evidently a paler form of the same variety, the tendency is to slate colour. I must add, however, that from the same broods, I bred a much larger number of the variety *destrigaria* than of the more extreme form.—GEO. T. PORRITT, Huddersfield: November 10th, 1888.

Notes on the larva of Gelechia peliella, Tr.—At p. 106, vol. ix, of the Natural History of the *Tineina*, Mr. Stainton describes the larva of this insect as “dark chocolate-brown, feeding in silken galleries among the lower leaves of *Rumex acetosella*.”

When last spring I found some larvæ thus feeding, but pale whitish-green in colour, with black head and second segment, I took little care of them, but was surprised to breed a pair of *peliella*; Mr. Bird, who also took some larvæ, bred six or eight. Mr. Stainton, on being informed of the fact, suggested that probably the larva he described had changed its livery before pupation. This year, however, both Mr. Bird and Mr. Bower, as well as myself, have bred the species pretty freely from the same larvæ, none of which turned black before pupation. The only conclusion, therefore, to be arrived at is that, though undoubtedly the real larvæ of *peliella* must have been in the plants of *Rumex* brought back by Mr. Stainton from Germany, yet another species with a black larva was also there, and this larva Mr. Stainton described as *peliella*, overlooking the real *Simon Pure*.

The true larva of *peliella* is of a pale whitish-green, with black head, and plate on second segment, having a quivering, tremulous motion when disturbed. It lives, as he states, in a silken tube at the base of the plant, often extending along the sandy surface, and then covered with grains of earth. Here it lies concealed by day, issuing forth at night to devour the leaves, and weaving a few slight threads up the stalk to the flowers, on which it seems to feed by preference. When quite young, I found it mining the early leaves of the plant, making therein small white bladdery spots, which assumed a pinkish tinge at their edges.—W. WARREN, 13, Cheyne Row, Chelsea, S.W.: October 15th, 1888.

[I find that my friend Herr Anton Schmid, who was with me when we found the larva of *G. peliella*, near Soden, in May, 1859, describes it as "*dunkelrothbraun*," Berlin Ent. Zeit., 1863, p. 62, and the fact remains that, whereas I did breed *peliella*, I did not breed the "other species with a black larva." I have frequently on other occasions bred *Sericoris lacunana*, from larvæ sent me as those of some other species, so that I am not altogether unfamiliar with that kind of proceeding.—H. T. STANTON].

Phibalapteryx lapidata in Argyllshire.—In the Ent. Mo. Mag. for November, 1887, vol. xxiv, p. 131, I noted the occurrence of *Phibalapteryx lapidata* at Glen Nevis in Inverness-shire. On the 10th of October this year I found a very faded specimen on a moor near Taynuilt in Argyllshire.—A. H. CLARKE, 109, Warwick Road, S.W.: November 12th, 1888.

Pterophorus heterodactylus, Haworth, and *Scoparia gracilalis*, Doubleday.—The type specimen of Haworth's *Pterophorus heterodactylus* has come into my possession, with his label attached. After careful examination I believe it to be identical with *teucarii*, Greening. Haworth's name, which is now sunk as a (doubtful) synonym of *hieracii*, Zell., should therefore replace *teucarii*, Greening. I have also some of Doubleday's original specimens of *Scoparia gracilalis*. These are undoubtedly *S. alpina*, Dale. They were given by Doubleday himself to Mr. Edwin Shepherd. I may add that Mr. Barrett agrees with both these determinations.—PHILIP B. MASON, Burton-on-Trent: October, 1888.

The scarceness of autumnal Lepidoptera.—One has been struck by the abundance of insect life, especially *Lepidoptera*, during the early spring and summer, which has been one of the wettest and most unfavourable seasons for collecting we have had for many years. Despite the weather, the insects were there, and in great abundance too; but directly summer flies were over, and the autumnal ones commenced to emerge, there was a great change observable, although the weather has been perfect during the last month or two, and has had every appearance of being most beneficial to the production of insect life. But the result has been the opposite, *Lepidoptera* have been excessively scarce, and very few of the commonest kinds were observed, as far as this neighbourhood is concerned.

Can any of your readers suggest a reason for this unusual paucity? My own explanation would be as follows, but doubtless may be incorrect in many details:—

Last summer (1887) was an exceptionally beneficial one to the production of insect life. The winter 1887—88 has been an exceptionally dry one, also very beneficial, especially to pupæ and hibernating larvæ. Now nearly all *Lepidoptera* which fly in spring and early summer are either in pupa during the winter, or hibernate in the larval stage; hence, putting these facts together, viz., a fine hot summer for the imagines and young larvæ, a dry winter for the pupæ and hibernating larvæ, and a tolerably fine early spring for the development of these latter, we have an explanation for the abundance of insects during the inclement summer.

Now with regard to autumnal *Lepidoptera*. These feed during early spring or summer, and, as a general rule, on low plants, which receive moisture more readily than shrubs or trees. Now low temperature seems rarely prejudicial (within limits)

beyond delaying progress and development, but wet is very fatal, especially to pupæ and young larvæ; the cold delaying their growth, and the wet rendering the food-plant crude and innutritious, and injurious to the larvæ, would doubtless be fatal to thousands of caterpillars throughout the country. I found many dead or dying whilst searching this summer, and many others I took soon turned sickly and died of a kind of damp rot. But this is not all, the poor larvæ that survived stood little chance, as when the greater part pupate (July) was the wettest month of the whole year, and too much moisture is certain death to pupæ.

I think these reasons will, to some extent, explain the great scarceness of autumnal insects; but it would be interesting to have other opinions on this subject (as there must be some explanation) whether I have hit the right one or no.—A. E. HALL, Norbury, Sheffield: October, 1888.

Spudastica petiolaris, Thomson.—Prof. C. G. Thomson, in fasc. xi of *Opuscula Entomologica*, has made the genus *Spudastica* for a very marked species of *Limneria*, Holm., which he named *petiolaris*; this is the same insect which I described in the *Trans. of the Entom. Soc.* for 1882, page 151, and named *Limneria Kriechbaumeri*. This insect has another peculiarity besides its structure, which I have not seen mentioned, that is the saltating power of the cocoon; this is rather globose, oval, chocolate, with a pale central zone. By holding the cocoon up to the light it is easy to see how the jumping is done. The larva presses the middle of the body against one side, and then curves the head and tail until they touch the opposite side of the cocoon a little way from the ends; it is then seen to blow itself out as if trying to burst, till at last the head and tail can no longer resist the pressure, when they instantly give way, but so rapidly, that I could not see the motion, but when they gave way, I could feel the smart rap on the cocoon, as well as hear it. After the larva had straightened itself, it resumed its former size and shape, and lay still at the bottom of the cocoon till it began the movement again. The cocoons will jump a considerable distance. These have, so far as I know, only been bred from *Tenio-campa*. I have received it from *T. gracilis*, *instabilis*, and from a doubtful species from Mr. W. H. B. Fletcher.—JOHN B. BRIDGMAN, Norwich: November 1st, 1888.

Notes on the dragon-flies occurring at Deal and Dover.—For the past eight years I have collected the dragon-flies of this district, in the hope of being able to record a goodly list of species. The result, however, has been very disappointing, as the following notes will show.

Sympetrum striolatum, Chp., common; *S. Fonscolombii*, Selys, one specimen at Deal, 1881 (recorded *Ent. Mo. Mag.*, vol. xxi, p. 21); *S. sanguineum*, Müll., at Deal and Dover, occasionally. *Platetrum depressum*, L., Common. *Libellula quadrimaculata*, L., Kingsdown, in 1881; *L. fulva*, Müll., one ♀, Kingsdown, 1881. *Brachytron pratense*, Müll.—this beautiful species is very common at Deal, especially the ♂, which is seen flying rapidly up and down the numerous dykes which intersect the land between Deal and Sandwich; the ♀ is generally taken away from the water, and has been found in shop windows in the town; I also took a fine adult ♀ in a woody district in Dover, May 5th, 1883. *Æschna cyanea*, Müll., and *Æsch. grandis*, L., both occur, but are decidedly scarce. *Lestes sponsa*, Hans., Deal. *Pyrrosoma minium*, Harris, very common. *Ischnura elegans*, v. d. Lind.; this

occurs both at Deal and Dover, and also at Folkestone; it is frequently accompanied by the dimorphous form of the ♀. *Agriion pulchellum*, v. d. Lind., Deal; *A. puella*, L., very common.—C. G. HALL, 14, Granville Street, Dover: October 22nd, 1888.

Adrastus pusillus, Fab.—I have repeatedly taken this insect at Deal and Dover, considering it a small dark form of *limbatus*. I have now separated the species in my collection, and amongst *pusillus* find one of the very dark specimens with only the pale humeral patch. I expect both species are mixed in collections, and I feel sure I have distributed some *pusillus* to some of my correspondents as *limbatus*. The dark brown antennæ, with the first three joints so conspicuously pale, serve easily to separate the species.—ID.: November 7th, 1888.

Two Coleoptera at Colorado.—Among a small lot of *Coleoptera* from Custer County sent to Dr. Hamilton lately, he finds two species apparently unrecorded for Colorado, namely, *Aphodius lividus*, Oliv., from the Hardserabble district (bringing the list of Colo. *Aphodii* up to 21), and *Mysia Hornii*, from the Eastern Slope of the Sangre de Cristo Range. There was also in the same collection an Aleocharid, which is undeterminable at present, and possibly undescribed.—T. D. A. COCKERELL, West Cliff, Custer Co., Colorado: September 28th, 1888.

Camnula pellucida, var. *obiona*.—Mr. L. Bruner has kindly determined three female locusts which I sent him from near Short Creek, Custer Co., about 8400 feet alt., as the *Tragocephala obiona*, Thos., 1870, and adds that it is probably but a localized and dark variety of *Camnula pellucida*. This is of some interest in view of the fact that *C. pellucida* appears to be extending its range eastward, and may eventually become a recognised injurious insect on the Atlantic as well as the Pacific slope of North America.—ID.

Coleoptera and Hymenoptera in the Hastings district.—The following are additions to the Hastings list: *Dromius vectensis*, a single specimen at roots of grass, near Fairlight; I have been quite unable to find any more, although I have searched again and again. *Sunius intermedius* and *Proteinus macropterus*, tufts of grass at Guestling; *Evæsthetus ruficapillus*, not uncommon round the edge of a pond near Ore; *Bledius atricapillus*, burrowing in the base of the cliff at Bexhill; *Scydmanus Poweri* and *Choleva angustata*, at Guestling; *Thymalus limbatus*, a few specimens under bark at Guestling, and one specimen bred from some larvæ found in old fungi in November; *Cis hispidus*, under decaying bark of beech in Broomham Grove, and *Cis alni* and *pygmaeus* in fungi at Fairlight; *Ceuth. chalybaeus*, from tufts in a swamp at Guestling. I have also met with the following: *Lebia chlorocephala*, *Stenolophus vespertinus*, *Encephalus complicans*, *Rhizophagus perforatus* (also on old bones), *Actobius cinerascens*, *Lithocharis brunnea*, *Agathidium lævigatum*, *Salpingus castaneus*, *Tropiphorus mercurialis*, and *Plinthus caliginosus* (7), all from tufts of grass in wet places; *Lycoperdina bovistæ* (1), in moss; *Choleva anisotomoides*, from the nest of the wood wren; *Anaspis fasciata* and *Adimonia sanguinea*, beaten from may blossom at Crowhurst; *Dorcus parallelopipedus* (12), at Winchelsea; *Pterostichus picimanus*, at Ore; and *Elmis Volkmani* (7), at Crowhurst. The early spring *Hymenoptera* were late, but fairly plentiful. I have met

with the following, besides commoner species : *Andrena Trimmerana*, ♂ and ♀, not uncommon, var. *spinigera*, ♂ and ♀, rather rare ; *A. cineraria*, single specimens only, at Winchelsea and Fairlight ; *A. thoracica*, common at Hastings, Ecclesbourne, and Fairlight ; *A. fulva*, near the Croft, but not nearly so common as usual ; *A. Clarkella*, ♂ and ♀—one specimen taken at Fairlight had only two submarginal cells instead of the usual three ; *A. Gwynana* and *minutula* were not rare ; and *Afzeliella* was to be found in some numbers, but appeared to be rather local ; *A. fasciata*, ♂, was extremely common on the hills immediately surrounding Hastings, but the ♀ was by no means common, and was a week later in appearing. *Nomada ruficornis*, var. *signata*, was not uncommon at the Croft, and *borealis*, ♀, and *Fabriciana* were fairly common at Fairlight ; of *N. flavoguttata*, I have only met with a single specimen ; *N. ochrostoma* was taken at Fairlight by my friend, Mr. Frisby and myself at Easter ; and *Sapyga 5-punctata* was dug out of rotten wood by me at Ore : both these species are additions to our list. The Rev. Canon Fowler has kindly determined many of the *Coleoptera*, and Mr. E. Saunders the doubtful *Hymenoptera*.—W. H. BENNETT, 11, George Street, Hastings : November, 1888.

Reviews.

AN INTRODUCTION TO ENTOMOLOGY: by JOHN HENRY COMSTOCK, Professor of Entomology, &c., in Cornell University. Part i, pp. 234, royal 8vo. Ithaca, New York. Published by the Author, 1888.

At the present time, American authors are prolific in the production of works on general entomology. We noticed one such work in our last number. We have now before us the first part of another, more extended and pretentious, by Prof. Comstock, which must find a place in the library of any working entomologist. A more detailed notice of the book is postponed until its completion. The method of treatment is original ; but the classification adopted is mainly that of Brauer. In addition to copious introductory generalities, the Orders (in the old sense) treated upon in Part i, are *Thysanura*, *Mallophaga*, *Orthoptera*, *Neuroptera*, and *Hemiptera*. The illustrations are copious ; many of them familiar to us as doing duty in any modern work on American entomology, and the best of these are acknowledged as "after Riley ;" many are new, from drawings by Mrs. Comstock.

CATALOGUE RAISONNÉ DES ORTHOPTÈRES ET DES NÉVROPTÈRES DE BELGIQUE : par E. DE SELYS-LONGCHAMPS. (Extrait des Annales de la Société Entomologique de Belgique, tome xxxii, 1888).

Upon referring to Hagen's "Bibliotheca Entomologica," we find that the compiler of this Catalogue has consistently followed up an idea dating from 1831 (if not earlier), when he published a list of the *Neuroptera* of Liège. He has subsequently, on several occasions, published lists, for the whole of Belgium, of *Orthoptera*, *Psocidæ*, and especially *Odonata*. With undiminished energy, 57 years since his first attempt, he now treats on the whole of the *Orthoptera* and *Neuroptera* ; and it is not a mere list of names (with localities) : there are often critical and historical notes appended, of much value. The purely local notes on distribution can be best appreciated by those who have a knowledge of the physical conditions of the king-

dom of Belgium, and the historical notes can be better understood by those who comprehend that Belgium is the most densely inhabited country in Europe, and that the necessities of population are usually (not always) in inverse ratio to the requirements of insect life.

A local list, based upon political frontiers, is frequently of small general value. Baron de Selys has, therefore, wisely worked in conjunction with Mr. H. Albarda, the Dutch Neuropterist. The latter will, we hope, soon dovetail his long-prepared list of the *Neuroptera* of Holland with this of Belgium.

Orthoptera are not so numerous as we thought they might be: only 47 species are catalogued, and of these nearly one-fourth belong to the genus *Stenobothrus*.

Of *Neuroptera* (in the broad sense) 327 species are enumerated. Taking the principal families, or large divisions, we find 22 *Psocidæ*, 64 *Odonata* (but some have become "historic," and others seem likely to follow), 28 *Ephemeridæ*, 21 *Perlidæ*, 44 *Planipennia* (in the broad sense), and 136 *Trichoptera* (in 1880, McLachlan estimated the number of Belgian species, then known to him, at 102).

The foregoing brief analysis will be useful in comparing the fauna with our own. No doubt very much remains to be discovered in all save *Orthoptera* and Dragon-flies. Critical pens will, as time goes on, correct a few obvious errors in the List, and industrious observers will largely augment it. The compiler may rest assured that, amongst all his numerous writings, he has done nothing that will be more useful than this to his own countrymen.

INSECT LIFE is the title of a new American Entomological periodical issued under the auspices of the U. S. Department of Agriculture, and edited by Prof. RILEY. It will be issued monthly, so far as circumstances permit, and each number (the first was published in July, 1888) appears to extend to 30 pp. 8vo. We think it cannot fail to prove both successful and useful. Of course, it is largely devoted to economic entomology; but there are also systematic papers, and we are glad to see, amongst these latter, the commencement of a Revision of Chambers' Index of the *Tineina* of the United States, by Lord Walsingham, which was much needed.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

The Annual Exhibition of this Society was held on the 17th and 18th October last, and on the second evening, when it was open free, by complimentary ticket, there was an attendance of over 1700 visitors.

Among the principal Entomological exhibits were those of Mr. McLachlan, British Caddis-flies, also European *Neuroptera*, chiefly *Ascalaphidæ* and *Nemopteridæ*. Messrs. Brunetti, Verrall, and Billups, British *Diptera*; the last named also exhibiting fine series of British *Coleoptera*, *Hemiptera*, and *Hymenoptera*. Mr. Leech, Palæarctic *Coleoptera*. Mr. West, British *Coleoptera*. Messrs. Weir, Dannatt, Edwards, Meek, Cooke, and Janson, Exotic *Lepidoptera*. Mr. A. H. Jones, European *Erebicæ*. Mr. C. A. Briggs, British *Nocturni*, including a specimen of *Cherocampa nerii*, taken 1888, at Poplar. Mr. Vaughan, his collection of *Colias* and *Dianthæciæ*, from various localities. Mr. Gregson, varieties of *Abraxas grossulariata*, and drawings of varieties of *Lepidoptera*. Mr. Mosley also showed some

excellent drawings of *Lepidoptera*. Mr. Machin, the genus *Lithocolletis*, &c. Mr. E. A. Atmore, *Eupithecia extensaria* and *Cabera pusaria*, and many other rare species. Mr. J. H. Leech, *Gonepteryx rhamni*, with the forms *Cleopatra*, *Cleobule*, *farinosa*, and *maderiensis*; *Colias Hyale* and *C. Erato*, with intermediate forms, and *Lasiocampa pini*, showing much variation, &c. Mr. Farn, the genus *Triphæna*, from northern and southern localities. Mr. Jenner, *Acidalia immorata*, from Lewes. Mr. Wellman, the genus *Acidalia*, &c. Mr. Russ, series of *Agrotis tritici*, and allied species, and *Epunda lutulenta*. Mr. R. Adkin, *Spilosoma mendica*, and its varieties. Mr. J. E. Robson, varieties of *Zygæna lonicerae*. Mr. Tugwell, the genus *Smerinthus*, all the British *Zygænida*, and the genus *Nola*. Mr. A. Marshall, comparative series from Rannoch, Isle of Lewis, and South of England. Mr. J. A. Cooper, forms and varieties from many localities. Mr. W. White, preserved larvæ. Mr. Jäger, *Callimorpha Hera*, &c. Mr. R. South, *Boarmia repandata*, from North Devon, with all the named varieties, &c. Mr. D. Chittenden, varieties of *Xanthia aurago*. Mr. S. Webb, *Lycænida*. Mr. Tutt, *Pterophoridae*. Mr. Elisha, bred *Geometra smaragdaria*, *Cidaria reticulata*, and *Eupithecia*. Mr. S. Stevens, *Pieris Daphidice*, hermaphrodite *Colias Edusa*, *Vanessa Antiopa*, &c. Mr. J. M. Adye, species from the neighbourhood of Christchurch, Hants. Messrs. Carpenter, Dobson, Goldthwait, Hall, Hawes, Helps, Joy, Mitchell, Smith, Strong, Williams, and others, also exhibited British *Lepidoptera*.

Over fifty microscopes were on the tables, and short lectures, illustrated by the oxy-hydrogen light, were delivered.

October 25th, 1888.—JOHN T. CARRINGTON, Esq., F.L.S., Vice-President, in the Chair.

Mr. E. A. Atmore, of King's Lynn, was elected a Member.

Mr. C. A. Briggs exhibited varieties of *Gnophos obscuraria*, Hb. Mr. Wellman, on behalf of Mr. A. E. Hall, interesting forms of *Lycæna Icarus*, Rott. Mr. Goldthwait, a pretty form of *Triphæna orbona*, Hufn. (*subsequa*, Hb.), varieties of *Argynnis Paphia*. Mr. Oldham, a pale form of *Charocampa porcellus*, L., a variety of *Argynnis Euphrosyne*, L., also *Neuroptera*, *Hymenoptera*, *Diptera*, and *Coleoptera*. Mr. J. M. Adye, bleached varieties of *Epinephele Janira*, L., a variety of *E. hyperanthus*, L., a melanic form of *Ematurga atomaria*, L., and a fine varied series of *Anchocelis lunosa*, Haw. Mr. Hawes, living larvæ of *Polyommatus Phlæas*, L. Mr. Tutt, on behalf of Mr. P. Russ, of Sligo, species of *Agrotida*, a fine series of *Epunda lutulenta*, Bork., showing two very characteristic phases of variation, one of a steely-grey colour, covered with white scales, with a distinct band, the females being darker than the males; the other very black in ground-colour, with the hind-wings white, the females being dark, with the anterior- and posterior-wings equally black. Mr. Tutt remarked that the pale continental form did not seem to occur in Britain. Mr. J. Jenner Weir, bred specimens of *Myrmeleon europæus*, with cocoons, and contributed notes.

November 8th, 1888.—The Vice-President in the Chair.

Messrs. H. W. J. Vaughan, F.E.S., W. Warren, M.A., F.E.S., W. D. Cansdale, F.E.S., C. Fenn, F. Oswald, E. Brunetti, H. A. Sauzé, A. Short, H. E. Hopkins, D. Chittenden, and Sydney Webb, were elected Members.

Mr. J. R. Wellman exhibited three bred series of *Acidalia aversa*, L. Mr. R. Adkin, *Crymodes exulis*, Lef., and *Pachnobia hyperborea*, Zett., from Shetland. Mr. Tutt, on behalf of Dr. Chapman, of Hereford, showed among other species, long series of *Acronycta tridens*, Schiff., for comparison with *A. psi*, L., both from Hereford. Mr. Tutt stated that Dr. Chapman had informed him that throughout the whole of the larval stages of the two species they were quite distinct. Mr. Step read a note from Mr. T. D. A. Cockerell, on the protective resemblance of a species of *Aphis* in Colorado, to a parasitic fungus (*Puccinia Bigeloviae*), very abundant in the same locality.—H. W. BARKER, *Hon. Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON: Nov. 7th, 1888.—Dr. D. SHARP, F.L.S., President, in the Chair.

Mr. H. Stuart Fremlin, M.R.C.S., of Mereworth, Maidstone, and Mr. G. V. Hudson, of Wellington, New Zealand, were elected Fellows.

Mons. A. Wailly exhibited a large and interesting collection of butterflies recently received from the Gold Coast and other parts of West Africa. The collection included about forty-seven species belonging to the genera *Papilio*, *Diadema*, *Salamis*, *Romaleosoma*, *Charaxes*, *Harma*, *Eurypheme*, *Junonia*, *Aterica*, *Hypanis*, *Eurytela*, *Mycalasis*, *Cyrestis*, *Nepheronia*, *Mylothris*, *Belenois*, &c.

Mr. Jenner Weir exhibited four bred specimens of ant-lions, two of which were from Saxon Switzerland, and the other two from Fontainebleau. He stated that he believed the specimens belonged to two distinct species. Mr. McLachlan said that the specimens all belonged to one species, viz., *Myrmeleon formicarius*, Auct., = *europæus*, McLach.

Mr. W. C. Boyd exhibited an example of *Pterophorus Zetterstedtii*, taken at Sydenham. He remarked that this species had hitherto only been recorded from Lynmouth and Folkestone.

Mr. Enock exhibited specimens of *Cecidomyia destructor* (Hessian Fly), illustrating the life-history of the species, and made remarks on them.

Mr. Wallis Kew exhibited a specimen of *Dytiscus marginalis* having a small bivalve shell attached to one of its legs. The bivalve had apparently attacked the *Dytiscus*, and refused to relax its grasp. A discussion ensued, in which Dr. Sharp, Mr. Stainton, and Mr. Kew took part.

Mr. W. E. Nicholson exhibited several specimens of *Acidalia immorata*, Linn., caught by him near Lewes. Mr. Jenner Weir remarked that the species had only recently been added to the British list, and that it was remarkable how so comparatively large a species could have been hitherto overlooked. It was also remarked that a specimen of this species from the collection of the late Mr. Desvignes had been exhibited by Mr. Stevens at the meeting of the Society in November, 1887.

Dr. Sharp exhibited a large number of species of *Rhynchophora*, collected by Mr. George Lewis in Japan.

Mr. F. P. Pascoe read a paper, entitled "Descriptions of new Longicorn Coleoptera."

Dr. Sharp read a paper entitled "The Rhynchophorous Coleoptera of Japan." —H. GOSS, *Hon. Secretary*.

CHRYSOCLISTA BIMACULELLA; ITS VARIABILITY IN
MARKINGS AND SIZE.

BY H. T. STAINTON, F.R.S.

In reply to my appeal (*ante*, p. 91) for British specimens of this insect for comparison *inter se* and with the Vienna specimens, I am happy to say that through the kindness of my friends I have now a sufficient number of British specimens before me, and ought to be able to come to a definite decision.

The Vienna specimens are always larger than the British specimens, expanding $7-7\frac{1}{2}$ lines, whereas the largest British specimen is only 6 lines in expanse, and that happens to be an unusually large specimen; but size alone scarcely affords a good specific character. In the Vienna specimens the orange blotch near the base, and that beyond the middle of the wing, are confluent, there being sufficient space between the first dorsal spot and the costal spot for a streak of the orange ground-colour to run through.

This does not happen in any British specimen I have yet seen, nor does it happen in a Zellerian specimen from Glogau, kindly lent by Lord Walsingham; yet this specimen is considered by Lord Walsingham and by myself as a form of the Vienna *bimaculella*, and, if we are correct in so doing, the confluence or non-confluence of the two orange blotches cannot indicate a specific character.

I will now briefly describe the Vienna form of *Chrysoclista bimaculella*, of which I have eight specimens before me:—

Expansion of the wings $7-7\frac{1}{2}$ lines. Head and face black; palpi grey. Antennæ black, with the tips white. Anterior-wings bright reddish-orange, with black margins; the costa broadly black to the middle, then narrowly black to considerably beyond the middle, where it is interrupted by the orange ground-colour (a little paler just there); the inner-margin has just a narrow black edging; the hind-margin broadly black. There are three silvery-violet spots, each with a black centre, two of them near the inner-margin, and one near the costa, this latter is placed nearer to the first inner-marginal spot than to the second; near the base just below the costa is a short silvery-violet streak, and a similar streak lies on the black portion of the costa beyond the middle; in three specimens I see, in addition to the above-mentioned markings, a silvery-violet streak at the base of the cilia, from the anal angle towards the apex; cilia blackish. Posterior-wings brownish, with blackish-brown cilia.

The British specimens I have before me are seven in number. I will indicate them by the letters *a, b, c, d, e, f, g*, and will note them in the order in which they reached me:—

a, from Lord Walsingham (labelled “Leith Hill, Mr. Harper’s collection”). Possibly this is the specimen noticed in the Ent. Annual, 1857, p. 128, as captured “by Mr. F. O. Standish, on Leith Hill, amongst sallow.”

Exp. barely 5 lin. No silvery-spots; no streaks; the first dorsal spot is simply a black spot; no trace of a second.

This, the first British specimen of *bimaculella* I examined this year, appeared to be abundantly distinct from the Vienna insect.

b, from Mr. J. W. Tutt, taken near Gravesend, amongst sallow.

Exp. 6 lin. The first dorsal and the costal spot silvery-violet, with some black scales; the silvery-violet costal streaks both present; no trace of the second dorsal spot.

The largest British specimen I have seen; it comes much nearer to the Vienna insect than *a* does, but, like *a*, is well distinguished by the total absence of the second dorsal spot. For nearly six weeks I was under the illusion that the absence of the second dorsal spot was the distinctive character of our British insect.

c, from Mr. P. B. Mason. Locality unknown.

Exp. 5 lin. The first dorsal spot silvery-violet, with black centre; the costal spot (much reduced in size) silvery-violet, much resembling the streaks, which are both present; the second dorsal spot is just indicated by a few silvery-violet scales towards the anal angle, they are better seen on the left wing than on the right one.

This is an interesting intermediate specimen.

d, e, f, g, from Mr. J. B. Hodgkinson, *d, e*, and *f*, taken by himself at Windermere, *g* from York.

Exp. 5—5½ lin. *e* and *f* agree very closely with *c*; *e* has the silvery-violet indications of the second dorsal spot about equally developed in both wings, in *f* they are more developed on the left than on the right wing. *g* has the second dorsal spot fully developed as a blotch projecting on the orange ground-colour, equally in both wings. *d* is so worn that at first sight I scarcely thought it worth noticing; but, after being startled by the new character shown by *g*, I looked critically at *d*, and, in spite of its wasted condition, I can still see on the left wing an intimation of a well-developed second dorsal spot!

Hence, we learn from Mr. Hodgkinson's specimens that the absence of the second dorsal spot is not the distinctive character of the British *bimaculella*, indeed, I can see no difference between Mr. Hodgkinson's *g* and Zeller's Glogavian specimen, and if that specimen be considered identical with the Vienna *bimaculella*, there is no reason for assuming that the Vienna *bimaculella* is specifically distinct from the British *bimaculella*, though the examination of specimens *a* and *b* only would have most certainly led me to an opposite conclusion.

Independently of the difference of size, I think in the British specimens the orange blotches lack the reddish tinge we see in the Vienna specimens.

Mountsfield, Lewisham:

November 19th, 1888.

ON THE HABITS, &c., OF CERTAIN BRITISH *MICRO-LEPIDOPTERA*.

BY W. WARREN, M.A., F.E.S.

I have lately come across some interesting accounts of hitherto unknown or little-understood larvæ of *Micro-Lepidoptera*, which seem almost, if not altogether, to have escaped observation in England.

These are: 1st.—A paper, entitled, “Descriptions de Chenilles de Micro-Lépidoptères inédites ou peu connues,” published in the *Annales de la Société Entomologique de France*, 1885, sér. vi, vol. 5, pp. 397—422, by M. Clement Lafaury, and read at the Meeting of that Society, held November 11th, 1885. 2nd.—Three articles, headed “Aus meinem entomologischen Tagebuche:” by Herr Ludwig Sorhagen, published in the *Berliner Entomologische Zeitschrift*, vol. xxv, 1881, pp. 17—34, vol. xxvi, 1882, pp. 129—158, and vol. xxix, 1885, pp. 81—108. 3rd.—A work by the same Herr Sorhagen, called, “Die Kleinschmetterlinge der Mark Brandenburg,” published in 1886, at Berlin, by Friedländer und Sohn.

There are so many new facts and scraps of information contained therein, along with a few errors which call for correction, that I have thought it worth while to go briefly through them, with a view to the assistance and enlightenment of those workers in this branch who have not access to the originals.

On the present occasion, I propose only to treat of the species mentioned in the “*Annales*” by M. Lafaury. The paper contains accounts of the larvæ of 24 species, 11 of which do not occur in England. The British species alluded to are the following:—

Crambus inquinatellus, Schiff. *Epischnia Boisduvaliella*, Gn., = *Farrella*, Curt. *Tortrix dumetana*, Tr. *Penthina (Sideria) achatana*, F. *Exartema (Ecopsis) latifasciana*, Haw. *Grapholitha littorana*, Const., = *Acroclita consequana*, H.-S. *Tinea flavescens*, Haw. **Depressaria badiella*, Hb. *Aplota palpella*, Haw. *Coleophora niveicostella*, Z. *C. albicostæ*, Haw. (erroneously called *albicostella*, Dup.). **Chauliodus insecurellus*, Stn. *Butalis siccella*, Z.

The three species marked * have been independently described in England: *badiella*, by the late Mr. Buckler, *Ent. Mo. Mag.*, vol. xxi, 1884, pp. 3—7; *insecurellus*, by myself, *Ent. Mo. Mag.*, vol. xxiv, 1887, p. 144; and *siccella*, by Mr. Bankes, *Ent. Mo. Mag.*, vol. xxiv, 1887, pp. 246, 247.

CRAMBUS INQUINATELLUS, Schiff.

Larva sluggish, greyish-yellow; head shining black; thoracic plate shining, concolorous with the body; spots and spiracles very large and conspicuous, feeds very slowly on *Hypnum*; spins up early in May, but only changes to pupa in August, and emerges a month later.

EPISCHNIA BOISDUVALIELLA, Gn.

"Larva 9 mm. Upper-surface red, slightly tinged with green, the dorsal region a little deeper, having on each side three or four fine lines, faintly marked, and slightly reddish, much confused and interrupted at the incisions of the segments. Under-surface yellowish-green, brighter than the upper. Head shining pale red; mouth reddish-black; thoracic plate large, shining, a little paler than the head; spiracles large, black, the first two larger, the last two smaller, than all the rest; anal plate wanting. Lives in the pods of leguminous plants, *Ononis arvensis*, *Astragalus* (*Anthyllis*), *Lotus*; chiefly on the last. The egg is laid on the upper lip of the calyx; the larva enters the pod at its apex, eats out the seeds, and leaves it by its lower end, attacking the nearest fresh pod, which it enters by the other end, which is nearly always in contact with the sand. It avails itself of this circumstance to spin some grains of sand against the end of the pod, to mask it from its enemies, till it has had time to gain the interior. Larvæ found July 12th, pupated on 18th, in an oval silken cocoon, finely woven, and pure white, covered with grains of sand; the imago emerged August m.; the larvæ found in September, in the pods of *Astragalus*, spin their cocoon at the end of the same month, to emerge the following May."

It is very probable that this double-broodedness is confined to the warmer districts in the south of France. But, as especial attention has not been directed to the detection of an autumn brood in England, it may yet occur here. At all events, the imago emerges in May with us, as in France.

TORTRIX DUMETANA, Tr.

"Larva green, with paler longitudinal stripes; on *Mentha aquatica* and *rotundifolia*, *Teucrium scorodonia*, and especially on *Scrophularia aquatica*."

In Ent. Mo. Mag., vol. xvi, p. 194, larvæ of *S. lacunana*, mentioned by Mr. Barrett as having been found by me in Wicken Fen on various low plants, "green, with light and dark stripes," really belonged to *dumetana*.

PENTHINA (SIDERIA) ACHATANA, F.

"Larva smoky-black, beneath rather yellowish; head and thoracic plate shining black; living in a web covered with dry leaves, and attached to the lower twigs of bushes of hawthorn, in company with *M. suavella*, which it much resembles; pupating the middle of May, in one end of the gallery; the imago appears early in June."

Two years ago, Mr. A. Thurnall bred the imago along with *suavella*, from larvæ collected in Epping Forest, without distinguishing one from the other.

ECCOPSIS LATIFASCIANA, Haw.

Larva shining pale yellow, with the alimentary canal in places showing blackish-green; head round, black; thoracic plate reddish; anal plate rather large, shining,

reddish or reddish-black. Feeding in silken galleries in the small patches of *Hepaticæ*, which grow on smooth barked trees, as lilac, ash, &c. There is no visible external sign of the presence of the larva within the tufts of liverwort; but if these are gently sundered from the trunks, the galleries at once become visible: these are of thick white silk, covered with gnawings from the bark and *débris* of the liverwort. Pupa within the gallery, long, pointed, shining red.

The larva had already been detected in Germany, for Sorhagen, in his work above mentioned, p. 104, says, "Larva in tubular galleries among tree-moss (Anton Schmid), in rotten wood of *Prunus domestica*, *Cerasus*, *Quercus*, *Betula*, &c. (Koch and others)." In the latter cases, the larvæ will probably have fed in the moss growing on the dead wood. The generic name *Eccopsis* must give place to *Exartema*, Clem., cf. Snell, p. 285.

GRAPHOLITHA LITTORANA, Const.

This species, described under this name in the Ann. Soc. Ent. Fr., 1865, p. 190, is nothing but *Acroclita consequana*; the description both of larva and imago tallying exactly. It seems as if it were fated to suffer from a superabundance of names. Herrich-Schäffer, after first calling it *consequana* in his plates, altered the name to *subsequana*, iv, p. 247, because Zeller had already called a species *consequana*; in the Ent. Ann. for 1856, p. 33, it is recorded as *Hawkerana*, after Rev. Mr. Hawker, who, in company with Mr. S. Stevens, discovered it in England, on Hayling Island. In 1859, it was re-christened twice: first as *arctana*, by Staudinger, S. E. Z., 1859, p. 232, and also by Millière, in his Icon., as *Mulsantana*. In Staudinger and Wocke's Catalogue it occurs twice more: on p. 251, as *Aphelia littorana* (*lanceolanæ* var. ?), and on p. 256, as *Semasia littorana* (but the last quotation is corrected in the corrigenda, p. 425).

I believe Zeller's *consequana*, Isis, 1847, 733, is the same species. The localities given for it are, Sardinia, Sicily, Spain; for *consequana*, H.-S., Central France, Andalusia, Sardinia, England.

It is not generally known that the species is double-brooded; the second brood feeding through October, and emerging in May of the following year.

TINEA FLAVESCENTELLA, Haw.

"Larva in a case like that of *pellionella*, but rather larger, and more fluffy. Full-fed before winter, when it affixes its case; whereas, *pellionella* feeds the winter through."

Tinea merdella, Z., I am told by Lord Walsingham is a synonym of *flavescetella*.

APLOTA PALPELLA, Haw.

Larva, 11 mm. Cylindric, slender, lemon-yellow, brighter below than above, with the dorsal region reddish, more or less dusted with blackish, and intermixed with yellowish. The reddish tint best marked on segments 7—9; being there less mixed with yellowish. Spiracular region vaguely marked with reddish, excepting, however, segments 3 and 4, where the markings are distinct. Head small, globular, shining black; thoracic plate also black, shining; anal plate reddish. Sluggish, living under the moss which covers the trunks of old oaks. It fashions a little gallery, either straight, or with several offshoots, and chooses for its situation generally the cracks of the bark; this gallery is prolonged, if necessary, in order to reach the shoots of moss on which the larva feeds. Pupating in the wider end of the gallery, after blocking up the two ends of the space it requires. Full-fed, iv, v.

COLEOPHORA NIVEICOSTELLA.

"Rare, and difficult to rear; appears to prefer the plants of thyme that are sheltered by shrubby growth."

*COLEOPHORA ALBICOSTA, Haw.

"Larva lives until it is full-fed within the seed-pods of *Ulex europæus*, without troubling itself to construct a case; but this it effects in a few minutes after quitting the shelter of the pod, by cutting one out of the margins of the lower lip of the calyx."

This explains the comparative rarity of the cases, and the difficulty of finding them.

CHAULIODUS INSECURELLUS, Stn.

Lafaury describes only the summer broods, the early spring brood having, apparently, not been noticed.

BUTALIS SICCELLA, Z.

"Larva long, thin, cylindric, smoky-violet above, but less dark below, with the incisions of segments 2—6 milky-white. This last colour well-marked, especially on the sides of the larva, and continued beneath. Incisions of the following segments paler than the ground colour, but not so strikingly so as in the preceding segments. Under-side of segments 3—6 more smoky-black than the rest. Head small, flattened, bone-colour, with the ocelli reddish-black. Thoracic plate faintly horny, much larger than the head, which it half covers when the larva is at rest; semicircular, concolorous with the head, faintly divided down the centre by a slight line, paler red than itself; its hind-margin clouded with blackish; the front marked with whitish.

"Spots brilliantly white and large for the size of the larvæ; spiracles invisible;

* Monsieur Lafaury has called this insect "*albicostella*, Duponchel;" but the insect figured by Duponchel under that name he received from Vienna, with the MS. name, *albicostella*, of Fischer von Röslerstamm; and this *albicostella*, of which the larva feeds on the leaves of *Potentilla cinerea* at the end of April, is a totally different insect from Haworth's *albicosta*, of which the larva feeds in June and July, in the pods of *Ulex*. Monsieur Lafaury's observation that the larva while feeding has no case, is a very interesting piece of information.—H. T. S.

anal plate scarcely horny, but large, shining, with its front straight, but laterally and posteriorly semicircular, ending in a slight point in the middle of its hind-margin.

" Mines the leaves of *Helianthemum guttatum*, *Cerastium vulgatum*, *Plantago lanceolata*, in April, and probably feeds on a variety of plants growing on sandy soils. One of the ends of its galleries is fixed to the under-side of a leaf, and from this the larva eats its way into the leaf, leaving the gallery fixed outside, as certain *Coleophora* larvæ do. If driven back, or even merely frightened, it retreats into its gallery, and will not venture out again. Never found in a mine after sunrise ; the mine occupies an elongated oval space between two ribs of the leaf.

" Pupa in a small silk cocoon, covered with grains of sand."

13, Cheyne Row, Chelsea, S.W. :

October 15th, 1888.

ON THE INTERPRETATION OF NEURAL STRUCTURE.

BY E. MEYRICK, B.A., F.E.S.

An esteemed but inexperienced friend of mine once discovered that in a certain New Zealand butterfly vein 11 of the fore-wings sometimes ran into 12, and sometimes did not. In recording the fact in a scientific periodical, he ventured to draw the inference that neu-ration ought never to be employed to define genera. Of this guileless person I was at once reminded in reading Lord Walsingham's interesting statistics of variation in *Cerostoma*, and the unwarranted conclusion which he draws from them.

The variability of veins 7 and 8 (called by Lord Walsingham the apical veins, though, as a matter of fact, neither is apical) in the fore-wings of *Cerostoma* has long been known, and is expressly alleged by von Heinemann as a reason for not sub-dividing the genus ; of this Lord Walsingham's figures supply an interesting and satisfactory confirmation. They prove that von Heinemann was right, and literally nothing more. Variability in *Cerostoma* no more entitles us to expect variability in *Æcophora*, for instance, than constancy in *Æcophora* does to expect constancy in *Cerostoma*. It is no new discovery that the same character is fixed in one genus and variable in another ; Darwin quotes instances (" Origin of Species"). Every genus and species has to be judged separately on its merits ; and, in forming this judgment, every careful worker, as Lord Walsingham must be aware, is accustomed to examine a sufficient number of specimens to ascertain variability, unless, indeed, he is unable to obtain them. Lord Walsingham has adduced one genus, in which veins 7 and 8 are sometimes

separate and sometimes stalked; let me quote two families in which they are never separate. Of the *Ecophoridæ* I have myself examined 800 species, and probably about 8000 specimens; of the *Gelechiadæ* about 500 species, and 3000 specimens; the whole at present classed in about 150 genera: in this entire number I have not found even a single specimen in which these veins are separate. And it should be observed that in so large a number there might well have been two or three exceptional instances, of the nature of monstrosities, which would yet not have invalidated the importance of the character. Here, then, is absolute fixity of a particular neural structure, extending throughout a very great number of species, and therefore applicable as a family character; yet I should never for a moment suppose that this mass of evidence afforded the slightest indication as to the permanence or value of the same character in *Stathmopoda*, for instance.

The questions on the elementary principles of classification in the latter part of Lord Walsingham's paper are exceedingly simple, and I have fully explained them elsewhere; but as I suppose they are meant to be answered, and as I probably do the majority of British Lepidopterists no injustice in imagining that any information whatever on neural structure is new to them, I will give a brief exposition.

(1). Where two forms of structure occur in the same species, are we to infer progressive development? No: we are to infer variability only; variability is a necessary condition of development, but in no way involves it. If, by continued observation, we found that one form was becoming scarcer and the other more numerous, we might infer development.

(2). When development takes place, which is the older or more ancestral form? This may sometimes be indeterminable; but it is often possible to decide by a consideration of allied forms, and a recognition of the principles (a) that a lost organ cannot re-appear, (b) that a rudimentary organ is rarely re-developed, (c) that a new organ is never spontaneously evolved out of nothing, but is a modification of something previously existing. To the third of these principles an exception must be made in the case of monstrosities; but if monstrosities are ever regularly reproduced under natural circumstances, the probability of its having happened in any given case is so small, that it may be practically neglected.

(3). Does the multiplication, or the diminution of veins constitute improvement? According to the third principle, multiplication of veins can never take place.

(4). When the apical vein is forked, does it result from the junction of two original veins, or the branching of one? It follows from the third principle that a simple vein cannot emit a branch. This may also be very simply proved by induction; for it will be found in all cases that when a vein is branched, the simple vein which should come next to it is missing. Thus, in the case of *Cerostoma*, it is only necessary to count the veins on the wing margin to discover that the number is the

same in all individuals, and that if, in those cases where vein 7 is forked, we were to suppose that it had become forked by division of its substance, or by budding, we should be compelled also to assume that by some mysterious coincidence vein 8 disappeared in precisely the same cases: whereas, the evident interpretation is that vein 8 is itself transformed, by partial fusion, into a branch of 7.

(5). Is simplification, or elaboration, to be regarded as progress? Both constantly take place, and theoretically either is equally likely to be advantageous; the direction of change is decided by so nice a balance of opposing circumstances, that we are in general unable to point out why a particular change is profitable. Of course Darwin has discussed this at full length.

Finally, it may perhaps be useful if I indicate the various changes which may take place in neural structure, as follows:—

(a). Obsolescence: a vein may lose its normal tubular structure, becoming attenuated and reduced in substance, until it appears a mere fold of the membrane. Ex.: vein 5 of the hind-wings in *Boarmia*.

(b). Stalking: two veins may be fused together for a portion of their length from their base, so as to appear to rise on a common stalk. Ex.: veins 8 and 9 of the fore-wings in all European *Pyrales*.

(c). Coincidence: two veins may be fused together for the whole of their length, so that one appears entirely absent; this is really an extreme form of stalking. Ex.: veins 10 and 11 of the fore-wings in *Urapteryx*.

(d). Anastomosis: two veins may rise separate, meet and be fused together for a certain distance, and then separate again. Ex.: veins 9 and 10, and also 10 and 11, of the fore-wings in *Cidaria*. This term is improperly used by Lord Walsingham for (b).

(e). Concurrence: a vein may rise separate, run into another, and not separate again; this is an extreme form of anastomosis. Ex.: veins 11 and 12 of the fore-wings of *Abraxas*.

(f). Connection: two veins may be connected by a short transverse bar passing from one to the other; this is a rather curious form of anastomosis, and is evolved from the ordinary form under the influence of a tendency to lateral extension. This structure is uncommon, and I do not remember a pronounced instance among English species; but I have described some very well-marked cases among exotic *Geometrina*.

All other changes may be included under the head of modifications in the direction or position of the simple veins.

Ramsbury: December 3rd, 1888.

[Having had, in the course of my studies in *Neuroptera*, to deal very largely with *neurulation*, and other structural characters, I long ago came to the conclusion

that THERE IS NOTHING CONSTANT IN NATURE; and I rather object to the use of the word "never" as applied to neururation or to any other character. Each case must be judged on its own merits. That which may be of paramount importance in one species, genus, or family, may be of the slightest importance in others. I could produce instances in species of which I have probably examined 500 examples with a neururation that so far might be styled "absolutely constant," but in which the 501st showed a condition of neural structure that might be termed "gone mad:" in such a case to have made a new species, genus, or family, on the neural condition alone would have been monstrous; it was the individual that was monstrous; but in a closely allied species variation in neururation might not be monstrous (within certain limits), but natural. Correlation of characters is, in my opinion, the aim of all systematic writing, not the seizure of one special character too often taken from insufficient materials. Even the term "monstrosity" is open to objection. It might be allowed where one individual in 500 shows extreme abnormality, but its application is open to question where one in ten shows it.—R. McLACHLAN.]

ON THE EXTENSION OF EUROPEAN *LEPIDOPTERA* TO JAPAN.

BY E. MEYRICK, B.A., F.E.S.

Having recently had the opportunity of examining a good deal of Japanese material, I was somewhat surprised to find how many well-known European species occurred unchanged in that country, and thought a note on some of these, which are apparently not sufficiently recorded, might be of interest. In none of those here mentioned is there any difference worthy of notice between the European and Japanese forms, except that, when the species is variable, the Japanese form varies more in the direction of development of the dark markings than the reverse. This has not, however, preserved them from being described as new species, as will be seen from the synonymy.

CEONISTIS QUADRA, L.; *O. dives*, Butl. Redescribed by Butler on a slight individual variation.

LITHOSIA DEPLANA, Esp.

LITHOSIA GRISEOLA, Hb.; *L. adauca*, Butl.; *Collita ægrota*, Butl. Normal pale greyish form.

CIDARIA SORDIDATA, F.; *Oporabia sexifasciata*, Butl. Somewhat larger than usual.

CIDARIA RIVATA, Hb.; *Melanippe supergressa*, Butl. Normal.

CIDARIA ALBICILLATA, L.; *Melanthia casta*, Butl. Normal; variable in size.

CIDARIA PROCELLATA, F. *Melanippe inquinata*, Butl., should apparently be regarded as a geographical form of this, but opinions might differ; it varies a good deal, and some specimens are very different looking, but others do not seem distinguishable by any character of value.

CIDARIA CORYLATA, Thnb. Normal.

CIDARIA TERSATA, Hb. Slightly larger than usual.

- TIMANDRA AMATA, L.; *T. convectaria*, Walk. Normal; also from Northern Hindostan.
- ASPILATES MUNDATARIA, Cr.; *A. tonghata*, Feld. Normal.
- ASPILATES FORMOSARIA, Ev.; *E. niponaria*, Feld. Normal.
- PHASIANE PETRARIA, Hb. Normal.
- ELICRICINIA CORDIARIA, Hb. Normal.
- CABERA EXANTHEMATA, Sc.; *Thysanochilus purus*, Butl. Normal. Butler does not appear to have suspected for how common an insect he was creating a new genus; on what ground I do not understand.
- BAPTA BIMACULATA, F. Normal.
- ABRAXAS MARGINATA, L.; *Lomaspidis opis*, Butl. Does not differ from normal dark European forms, but lighter marked varieties seem infrequent.
- ABRAXAS ADUSTATA, Schiff.; *Melanippe restituta*, Walk.; *Melanthia efferata*, Walk. Normal.
- ABRAXAS SYLVATA, Sc. (*ulmata*, F.); *A. martaria*, Walk.; *A. leopardina*, Walk.; *A. miranda*, Butl. Occurs also in North Hindostan and China; of course always a variable species, but without local forms, except that Indian and Chinese specimens are generally larger, sometimes considerably.
- ABRAXAS GROSSULARIATA, L.; *A. conspurcata*, Butl. Dark varieties seem more prevalent than light ones.
- RHYPARIA MELANARIA, L.; *R. fraterna*, Butl.; *R. sordida*, Butl. Normal; except that in the Corea a dwarfed form appears to prevail.
- ANGERONA PRUNARIA, L. Normal.
- HYBERNIA LEUCOPHÆARIA, Schiff.; *H. dira*, Butl. Normal, but often darker.
- ASOPIA GLAUCINALIS, L.; *Pyralis yokohamæ*, Butl. Normal.
- PIONEA FORFICALIS, L.; *P. sodalis*, Butl. Normal.

Ramsbury: November 17th, 1888.

ON A HITHERTO UNDESCRIBED SPECIES OF THE GENUS
PHANÆUS, MACLEAY.

BY B. G. NEVINSON, M.A., F.Z.S.

PHANÆUS LUGENS, n. sp.

Ph. prasino, Har. *affinissimus*, sed *omnino nigerrimus*, *subnitidus*; *clypeo integro*, aut *vix emarginato*; *tibiis anticis quadridentatis*, *dente quarto minutissimo*; *pygidio rugose punctato*.

Mas major: *capitis cornu elongato, recurvo, ad basim leviter incrassato, sed postice emarginato*; *thorace basi bi-impreso, distincte ac confertim granulato, deplanato-declivi, parte plana truncato-triangulari antice quadrituberculata, elevato-marginata, angulis posticis acutis recurvatisque*; *elytris late striatis, striis obscure crenato-punctatis, interstitiis valde convexis subtilissime punctulatis*; *corpore subtus nigro-hirsuto*.

Mas minor: *capitis cornu brevissimo*; *thoracis disco triangulari angustiore*.

Mas effeminatus: *capitis cornu obsoleto, cujus in loco carina arenatim elevata*; *thorace convexo, antice disco deplanato utrinque carinis minimis marginato*.

Femina : capite antice rugoso, postice grosse punctato, carina elevata vix perspicue trituberculata; thorace convexo rugose punctato, antice carina trituberculata, tuberculo medio majore cum carinula ad thoracis marginem anticum tendente; post tuberculos vix concavo. Tibiis anticis cum tarsis minutis. Long. 15—22 mill.

Hab. : Venezuela.

This species is closely allied to *Ph. prasinus* and *Hermes*, Har., than either of which it is slightly larger, and from which it is moreover well distinguished by its intensely black and wholly non-metallic coloration. In rare examples of the female, the three tubercles stand out separately on the thorax unconnected by any carina, just as they do in normal females of *Ph. Pyrois*, Bates. In its range *Ph. lugens* appears to be restricted to Venezuela, where, however, from the numbers to be seen in my own and other collections, it must be very common. Nevertheless, up to the present time, as far as one can learn, it has escaped description.

6, Tite Street, Chelsea, S.W. :
November 29th, 1888.

CAPTURE OF *HADENA ALBIFUSA*, GROTE, IN GREAT BRITAIN.

BY C. G. BARRETT, F.E.S.

In a box of *Noctuæ* sent for examination by Major Partridge, Commandant at the Isle of Portland, I found a specimen of a *Hadena* allied to *dentina*, and more distantly to *chenopodii*, but evidently quite distinct from any known British species. Judging by descriptions, it appeared to be near to *H. sociabilis* or *H. marmorosa*, but failing to satisfy myself by correspondence, I sent the specimen to my friend, Mr. W. F. Kirby, who took great pains with it. Finding that it did not agree with any European species in the National collection, he searched further and had the satisfaction of finding that it agreed very well with *H. albifusa*, Grote, a native of North America.

Major Partridge informs me that he took it at sugar, on the night of August 15th, on the undercliff near Portland Castle, and not far from the anchorage. It is, therefore, possible that it may have escaped from some passing American vessel after making the ocean voyage in the pupa state, or otherwise concealed among merchandize, but its fine condition forbids the idea that it can have flown any very great distance. It is equally possible that it may have been reared on the spot, the produce of an accidentally introduced specimen. It would be very curious if this North American species should succeed in establishing itself with us.

The ground-colour of fore-wings of this specimen is pale grey, with a very faint yellowish gloss, and is clouded with dark grey along the costa, which also is pretty regularly spotted with blackish. Both transverse lines are indistinct, blackish edged with pale, the first much interrupted and angulated, the second indented into crescents. The orbicular stigma is large, roundish, and whitish, the renal also large, dark grey, with a perpendicular pale shade down its middle, the claviform very broad, almost lunate, grey, all three edged with black. From the whitish orbicular stigma a pale oblique band, to near the anal angle, meets another broad, pale band from the apex of the wing. Hind-margin much clouded with dark grey, subterminal line whitish, interrupted, indented, and with a conspicuous W in the middle. At the base of the wing are several curved blackish lines between the nervures, cilia pale grey, spotted with darker. Hind-wings whitish to beyond the middle, with a broad, ill-defined, dark grey band along the margin, cilia white, with a line of pale grey dots or flecks, Head, antennæ, thorax and abdomen, grey-brown.

It looks something like a small pale *dentina*, with which species Major Partridge tells me that he at first placed it, but, from the distinct, central, pale, oblique band, bears also some resemblance to *contigua*.

I hear, with much regret, that Major Partridge is leaving Portland with his regiment. His opportunities for working that finely situated, but difficult and rather dangerous locality, have been exceptional, and the results *quite remarkable*.

King's Lynn, Norfolk :
December 10th, 1888.

ON THE SUPPOSED NEW BRITISH *TORTRIX*—*RETINIA*
POSTICANA, ZETT.

BY C. G. BARRETT. F.E.S.

I find that it will be necessary for me to give reasons for my belief that this form, formerly supposed to be *R. duplana*, Hb., is merely small, dark *turionella*, L.

The first British specimen of the so-called *dupleana* which I had an opportunity of examining was sent to me for that purpose fifteen or sixteen years ago by my lamented friend, Mr. Doubleday. To the best of my recollection, it was *as large as ordinary turionella*, but decidedly browner in colour—a ♀,—very curious in appearance, and different from all that I have since seen; doubtless, it may still be seen in the Bethnal Green Museum. Subsequently, at long intervals, I have, thanks to the kindness of friends, examined, I think, the majority of the other old captures of this insect, and they all agree very well with those taken last year by my old friend, Mr. Albert Jones, and those secured this year (1888) by Mr. Salvage. Of these last I have,

by Mr. Salvage's kindness, been enabled to examine seven specimens. They are—like those previously seen, small—not more than one-half the size of ordinary southern *turionella*, their fore-wings very dark brown-grey, with leaden transverse lines, and the apical third occupied by a large rust-coloured blotch. Hind-wings grey, with whitish cilia, but not all equally dark, one even having the basal portion decidedly paler. Head and thorax rust-coloured.

I am simply reiterating a previous statement when I say that these specimens do not in the least represent the true *duplana*, Hb., in fact, *duplana* has really nothing to do with the present question, and I merely refer to it in deference to the remarks upon it by Mr. Warren (*ante*, p. 146). As far as *posticana* is concerned, the grey-headed, glossy-winged *duplana* may be set entirely aside.

Of *turionella* I reared a considerable number some years ago from pupæ found in the unexpanded shoots of *Pinus sylvestris* in Surrey. Of these I still have about a dozen. These vary in size, most of them being of the usual full size, but one being hardly larger than the Scotch form, and another intermediate. In these Surrey specimens the colouring is bright brownish-grey, with lustrous leaden lines, but the rust-colour is very unequally distributed, some specimens showing it only on the large apical patch, while in others all the darker markings are more or less tinged with it. The ♂s have whitish hind-wings, more or less tinged with grey towards the hind-margin; in the ♀s these are variably darker in both respects. In some specimens of both sexes the apex of the hind-wings is tinged with rust-colour, in others this is absent.

Last spring I found, in the same manner, two pupæ in this (King's Lynn) neighbourhood. The moths produced—both ♂—are quite different in colour, being very strongly tinged with slate- or silvery-grey, except on the rusty patch, which is confined to the apical third. Their hind-wings are unusually white. These Norfolk specimens differ almost as much in colour from the brownish or rusty Surrey specimens as they do from the dark brown-grey Scotch form, but they are of the usual full size.

It thus appears that those from Surrey are variable in colour and size, and in the degree of lightness of the hind-wings; those from Scotland are fairly constant in their small size, and in their dark fore-wings, but vary in degree of darkness of the hind-wings; while the Norfolk specimens, with grey fore-wings, have the hinder the lightest. I have examined all very carefully, and with a real anxiety to find

distinctive characters, if present, but am compelled to the belief that the differences are merely of degree of colour, and not specific.

The only *distinctions* which Mr. Warren specifies are for *posticana*, "the smaller size" and "the colour of the hind-wings;" but, as I have shown, southern *turionella* vary down to the same size, and there is no constancy in the colour of their hind-wings. If the Scotch specimens are examined under a pocket lens of low power, they seem to me to resolve themselves into unmistakeable *turionella*.

After seeing the extraordinary variations in colour in *Hepialus humuli*, *Emmelesia albulata*, *Triphæna orbona*, and many other species brought from the north of Scotland by Mr. Salvage and others, it seems to me hardly reasonable to propose to establish a new British *Tortrix* on such slight grounds. Indeed, the distinctions between ordinary *Eupæcilia angustana* and its Shetland variety, *thuliana*, are far greater.

The question whether or not this Scotch form of *turionella* is really the insect described by Zetterstedt, under the name of *posticana*, is of a more critical character, but it would be reasonable enough to expect that this Scotch form would also be found in Lapland. I have not access to the original description by Zetterstedt, but Heinemann, who received some of his specimens from Wocke, doubtless refers to the same insect. He describes *posticana*: "Fore-wings grey-brown, waved with lead-grey, bordered or edged with rust-yellow, with two lead lines. Hind-wings brownish-grey, head and thorax rust-yellow." *Turionana* he describes: "Fore-wings brown-grey, or brown-yellow, waved with leaden-grey, bordered (or edged) with rust-yellow, with two leaden-grey cross-lines. Hind-wings in the male whitish, with greyer apex, in the female greyer, with the apex tinged with rust-yellow."

The difference between grey-brown and brown-grey does not seem to be very material, and he evidently recognises this, since he goes on (under *turionana*) to give a general description applicable to both species. Then he proceeds to say that *turionana* is larger than the other, but that a specimen of *posticana* from Kreuth is like it (*turionana*) in size, and that its hind-wings are somewhat lighter at the base, though in all other respects it agrees with *posticana*. Other slight distinctions in colour indicated by him are quite demolished by reference to the variations of southern British specimens, but he goes on to say that *posticana* may be separated from *turionana* by the more curved costa of the fore-wings and the greater breadth of the hind-wings. And again, in describing *turionana*, he emphatically states that its

hind-wings are *narrower and more pointed* than those of *posticana*. If this is the case, the question with regard to our Scotch form is finally settled, since its hind-wings are not broader, nor its costa more curved than in *turionella*, but the two forms are proportionately most accurately the same in shape of fore- and hind-wings.

Therefore, in the absence of typical specimens, I think I am justified, not only in the belief that our Scotch insect is identical with *turionella*, but also in the supposition that Zetterstedt may have had under his notice another species, closely allied, but of different structure.

I am still faced by two difficulties not fully bridged over: one is that Mr. Warren is generally most accurate and reliable in his determinations of species; the other, that Mr. Salvage believes that he reared one of his specimens from a pupa found *under fir bark*. This latter habit, if confirmed, would be somewhat startling.

King's Lynn: *December 3rd, 1888.*

Plusia ni in Dorset.—With reference to the capture of *Plusia ni* recorded in your last number, it may interest Mr. Barrett and others of your readers to hear that my brother netted an excellent specimen of the above mentioned insect in the vicinity of Swanage, Dorset, in August, 1885. Unfortunately, the net being damp, the thorax is somewhat rubbed, otherwise the insect is in first-rate condition. Although the species is readily to be distinguished from its allies, to make assurance doubly sure, I showed the specimen to Messrs. Butler, Waterhouse, and other entomologists, who all unhesitatingly pronounced it to be an indubitable *P. ni*.—B. G. NEVINSON, 6, Tite Street, Chelsea, S.W.: *December 15th, 1888.*

Lepidoptera near Marlborough in 1888.—The following are a few notes on species new to the district, or otherwise interesting. As a whole, the season was the latest here of which we have any record; many species were a full month late. For example, *Liparis monacha* usually appears here in August, about the 4th (the average of seven previous first observations); this year the first specimen, freshly emerged on a tree trunk, was taken September 24th, and others equally fresh for several days afterwards, the species being found up to October 10th.

Zygana filipendulæ.—A colony of this species, frequenting a small patch of heath, was remarkable, in that the sixth spot of the fore-wings was, in fully three-fourths of the individuals, greatly reduced in size, sometimes indeed so inconspicuous that it might well have been passed over as absent. As in the other fourth the spot was of its usual size (with connecting links), and as there appears to be no other definite difference between the forms, I suppose we have here a case of an individual variation becoming prevalent through isolation; or might the colony possibly have been crossed with one of the five-spotted species? I observed no specimens showing this variation among other colonies in the district; and where the species are so little defined as in this genus, it appears worthy of record.

Eupithecia irriguata.—I found this species in plenty on a fence beneath oaks

after a high wind, appearing rather later than *E. abbreviata*. *E. arceuthata*.—One specimen from juniper on the downs; not previously observed.

Penthina rivulana.—Although accounted widely distributed, I never met with the species until this season, when I found it common, but in an exceedingly restricted locality only.

Eudemis euphorbiana.—I was surprised to find this species locally rather common among *Euphorbia amygdaloides* in the Forest, flying in the sun, and not particularly easy to see.

Pandemis cinnamomeana.—Turned up commonly in a wood of old spruce-fir and larch trees, to which I suppose the larvæ is naturally confined.

Psecadia decemguttella.—Is not this overlooked? I find the larva round here wherever the food-plant grows; the imago more rarely.

Micropteryx aruncella and *M. Seppella*.—What evidence is there that these are not varieties of the same species?—I take what appear to be both forms together under circumstances which seem to make it probable.

Batrachedra præangusta.—I often formerly searched for this species round here without result; but this year I found it in great abundance on a solitary tree of the giant sallow in the Forest. Why so restricted, I have no idea.—E. MEYRICK, Ramsbury: November 26th, 1888.

Scoparia gracilalis.—I am glad to see that Mr. P. B. Mason and Mr. C. G. Barrett agree in the opinion I expressed in 1885 (Entom., vol. xviii, p. 130) as to the specific identity of *S. gracilalis* and *S. alpina*. The late Mr. Nicholas Cooke, who had probably more experience of *S. gracilalis* than any one since Weaver first took it in 1854, was nearly convinced of it, and was, indeed, bringing specimens from his own collection for final comparison with mine, when his melancholy death occurred. Mr. Doubleday's own specimen of *S. gracilalis* has for years been with his collection at Bethnal Green Museum.—C. A. BRIGGS, 55, Lincoln's Inn Fields: December 10th, 1888.

Pezomachus corruptor, F., ♂ ♀, and *Charops decipiens*, Gr.—Mr. W. H. B. Fletcher has this season, from *Taleporia triquetrella*, been fortunate enough to breed both sexes of *Pezomachus corruptor*, F.; the ♂ is apterous, and appears to me to be the species Förster described as *P. insidiosus*, of this he had only a single specimen, and probably *P. dysalotus*, F., is the same species. He has made three divisions of those males having a distinct scutellum, viz., those having the spiracles on the first segment of the abdomen very prominent, moderately prominent, or not projecting at all. This does not appear to be a constant characteristic, any more than the transverse costa on the metathorax, as all these divisions appear in those bred by Mr. Fletcher, the spiracles varying from very prominent to not projecting at all; the coloration also varies, the first four and sometimes six joints of the antennæ are red, the neighbourhood of the scutellum, sides of thorax more or less, and posterior part of metathorax, is black or brown, the abdomen varies from the first two segments red, third segment red with a central transverse dark blotch to entirely red; the female also varies, one of them has the 4th and 5th segments dark brown, in this respect answering to *P. faunus*, F., which may possibly be only a variety of *P. corruptor*. Mr. Fletcher has also bred *Charops decipiens*, Gr., from *Zygana trifolii*. I believe this is the first time it has been recorded as having been bred in Britain, and I believe only twice before on the continent. It appears to be rare

here; it makes a blackish-brown cocoon inside the well-known straw-coloured outer covering of *Zygæna* cocoons, and is closely adherent to its inner surface.—JOHN B. BRIDGMAN, Norwich: November, 1888.

Callicera ænea.—While I suppose among Lepidopterists the year 1888 will be known as the "*Galii*" year, so among Dipterists I think it must rank as the "*Callicera*" year, as in twenty-two years' collecting I had never heard of a specimen being caught in England, except the one mentioned by Walker as caught at Petersfield, Hants., until (1) the Rev. E. N. Bloomfield caught a ♀ (now by his kindness in my collection) at Guestling, near Hastings; (2) the Rev. T. A. Marshall caught a specimen (which I have seen) at Cornworthy, near Totnes; and (3) I have heard from Dr. Capron of a specimen taken by a Coleopterist (I am sorry I cannot quite decipher his locality).

As to *Deilephila galii*, I have heard of one amateur entomologist taking nine larvæ almost in the town.—G. H. VERRALL, Sussex Lodge, Newmarket: Dec., 1888.

Colorado Coleoptera.—A short time ago, I went through a miscellaneous lot of *Coleoptera* collected in Western Custer Co. (mostly at 8400 feet alt.) this season, and sent a large selection to Dr. John Hamilton for examination. Among them he finds three more species apparently new for Colorado, viz., *Tachycellus badiipennis*, *Edionychis lugens*, and *Paratenetus fuscus*, Lec., the last he says is also found at Allegheny, Pennsylvania. I am also able to make an interesting addition to my list of species common to Europe and Colorado, viz., *Hylotrupes bajulus*, L. Other interesting additions to the Custer Co. list found in this consignment are *Notiophilus sibiricus*, Motsch. (found also in Labrador and in the Eastern States), *Coccinella sanguinea*, L., *Hister depurator*, Say, *Diploaxis Haydeni*, *Leptura subargentata*, Kirby, *Graptodera foliacea*, Lec., *Phyllotreta albionica*, Lec., *Lepidophorus lineaticollis*, Kirby, *Ceuthorhynchus*, "*n. sp.*, but in many collections," *Baris transversa*, &c. A water beetle from the Hardscrabble district, which was supposed to be *Ilybius picipes*, now proves to be *Agabus tristis*, Aubé, and apparently new for Colorado.—T. D. A. COCKERELL, West Cliff, Custer Co., Colorado: October 17th, 1888.

Another ash-flower-gall inquiline.—The larvæ of many insects live in galls made by other insects or by mites, as the cauliflower ash-gall. In the September number of this Magazine for this year, Dr. Chapman records the occurrence of the larvæ of the little moth *Prays Curtisellus*, var. *rustica*, in this gall; and in the same number I described the little Cecid *Diplosis fraxinella*, bred from larvæ also found by Dr. Chapman in the same. I now beg to call attention to the larvæ of another fly, two of which were discovered by Dr. Chapman as well, in the same retreat, and were kindly transmitted by him to me in the pupa state in May last. From one of these an imago of *Chyliza leptogaster*, Pz. (a little fly belonging to the *Psilidæ*) escaped on the 4th June following. Schiner* records that this species has also been bred by Scholtz, from galls formed in the stalks of *Spiræa opulifolia*. Scholtz did not state, however, whether this insect was the gall maker, so, in all probability, it was only an inquiline in that gall as well as in the ash-gall. I have recorded this occurrence, as any fact bearing upon the life-history of insects is of interest.—R. H. MEADE, Bradford: November 22nd, 1888.

* Fauna Austriaca Diptera, vol. ii, p. 200.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.
November 22nd, 1888.—JOHN T. CARRINGTON, Esq., F.L.S., Vice-President, in the Chair.

Messrs. W. G. Dawson, F. E. Brown, A. Marshall, and J. Katz, were elected Members.

Mr. J. Jäger exhibited *Agrotis præcox*, L., from Glamorganshire; dark forms of *Acidalia marginepunctata*, Göze, from South Wales; *Cidaria reticulata*, Fb., from the Lake District; and *Lobophora viretata*, Hb., from Staffordshire. Mr. E. B. Nevinston, *Leucania putrescens*, Hb., South Wales; *Acontia luctuosa*, Esp., Surrey; two dark specimens of *Heliothis peltigera*, Schiff., one taken on the 15th and the larva of the other on the 18th of August, which did not produce the imago until the 17th of September. Mr. R. Adkin, *Pieris napi*, L., from West Ireland, approaching var. *bryonia*, Hb.; *Ellopiopsis prosapiaria*, L., from English and Irish localities, &c. Mr. Tugwell, two specimens of *Margarodes unionalis*, Hb., taken in 1877, at Kingsdown, Kent, off flowers of *Eupatorium cannabinum*, L.; two examples of *Mecyna polygonalis*, Hb., both taken in 1877, one at Deal and the other at Kingsdown; a series of *Eupithecia extensaria*, Frey., from King's Lynn; and *Acidalia immorata*, L., from Lewes; and contributed remarks. Mr. Henderson, examples of the second brood of *Tephrosia crepuscularia*, Hb., from Oxfordshire. Mr. Hawes, ova of *Bombyx neustria*, L., clustered round the stalk of the fruit of pear. Mr. West (Streatham), *Polia chi*, from North Wales.

December 13th, 1888.—T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Messrs. G. Tindall and M. Winkley were elected Members.

Mr. Frohawk exhibited the specimen of *Vanessa Antiopa*, L., taken by him at Chatham. Mr. R. Adkin, on behalf of Mr. Austin, a pale fawn-coloured variety of *Epinephele Janira*, L.; a strongly marked example of *Cænonympha Pamphilus*, L.; and other varieties. Mr. Carrington, a strongly marked variety of *Vanessa c-album*, L., taken near Droitwich. Mr. Adye, unusually large and small examples of *Selenia tetralunaria*, Hufn., and *Metrocampa margaritaria*, L. Mr. J. T. Williams, *Acidalia immorata*, L., from Lewes; *Deiopeia pulchella*, L., from Southbourne, 1876; and *Cymatophora or*, Fb., from the Hebrides. Mr. Helps, *Ptilophora plumigera*, Esp. (bred). Mr. R. South, British and foreign examples of the genus *Dianthæcia*, allied to *D. nana*, Rott., and contributed notes thereon. Mr. R. Adkin exhibited series of *D. nana* from Kent, Surrey, Shetland, and the Hebrides, and Mr. Hall series of many species of *Dianthæcia*. Mr. South also exhibited a form of *Gortyna ochracea*, Hb., from Perthshire. Mr. W. H. Tugwell, forms of *Hypsipetes sordidata*, Fb., bred from larvæ received from Huddersfield; and *Agrotis simulans*, Hufn., from Aberdeenshire. Mr. Manger, *Dynastes Hercules*, Fab., from Montserrat; *Chalcosoma Atlas*, Fab.; *Megalosoma Thesus*, Fab.; and a species of *Chrysomelidæ*; also *Miaris micros*, Germ., taken by Mr. West in Headley Lane by sweeping in the year 1884. Mr. West stated that the year he took this species it was abundant, but he had not been able to find it since. Mr. Billups also exhibited *Hotinus clavatus*, Westw., taken by Mr. Elwes at Darjeeling in 1886.—H. W. BARKER, Hon. Sec.

ENTOMOLOGICAL SOCIETY OF LONDON: Dec. 5th, 1888.—Dr. D. SHARP, F.L.S., President, in the Chair.

Mr. B. A. Bower, of Eltham, Kent, was elected a Fellow of the Society.

Mr. W. F. Kirby exhibited, for the Rev. Dr. Walker, a variety of the female of *Ornithoptera Brookiana*; he also exhibited, for Major Partridge, an undetermined species of the genus *Hadena*, captured last summer in the Isle of Portland.

Mr. R. South exhibited a series of specimens of *Tortrix piceana*, L., from a pine wood in Surrey; also melanic forms of *Tortrix Podana*, S., from St. John's Wood.

Prof. Meldola exhibited, for Dr. Laver, a melanic specimen of *Catocala nupta*, taken last September at Colchester.

Mr. E. B. Poulton exhibited preserved larvæ of *Sphinx convolvuli*, showing the extreme dark and light forms.

Mr. McLachlan called attention to a plate, representing species of the genus *Agrotis*, executed by photography, illustrating a memoir by Dr. Max Standfuss, in the Correspondenz-Blatt, Verein "Iris," in Dresden, 1888. He considered it was the best example of photography as adapted to entomological purposes he had ever seen, especially as regarded its stereoscopic effect.

The Rev. Canon Fowler exhibited a specimen of *Mycterus curculionoides*, L., sent to him by Mr. Olliff, and taken by Mr. Gunning near Oxford about 1882.

Mr. W. Nicholson exhibited several melanic varieties of *Argynnis Niobe* and *A. Pales*, collected by himself last summer in the Engadine.

Mr. J. H. Leech exhibited a small collection of *Lepidoptera* formed last year by Mr. Pratt at Kiukiang, Central China. It included several new species, also specimens of a variety of *Papilio Sarpedon* and other interesting forms.

Mons. A. Wailly exhibited a collection of *Lepidoptera* lately received from Assam, containing upwards of thirty-five species of *Papilio*, *Ornithoptera*, *Charaxes*, *Diadema*, *Cyrestis*, and other genera.

Mr. Meyer-Darcis exhibited specimens of *Sternocera tricolor*, Kerr., and *S. variabilis*, Kerr., from Lake Tanganyika; also two new species of *Julodis* from Syria.

Mr. F. Merrifield exhibited, and made remarks on, a long series of *Selenia illustraria*, *S. illunaria*, and *E. alniaria*, in illustration of his paper on "Pedigree Moth-breeding."

Lord Walsingham exhibited, and made remarks on, a series of species representing the genera *Snellenia*, Wlsm., *Edematopoda*, Z., and *Eretmocera*, Z.

The Rev. T. A. Marshall communicated a paper, entitled, "A Monograph of British *Braconidæ*. Part III."

The Rev. Dr. Walker communicated a paper, entitled, "Description of a variety of the female of *Ornithoptera Brookiana*."

Lord Walsingham read a paper, entitled, "A Monograph of the genera connecting *Tinægeria*, Wlk., with *Eretmocera*, Z." A discussion ensued, in which Mr. Stainton, Dr. Sharp, and others took part.

Mr. Merrifield read a paper, entitled, "Incidental Observations in Pedigree Moth-breeding." This paper contained a detailed account of experiments with *Selenia illustraria*, *S. illunaria*, and *E. alniaria*, which, so far as they had yet proceeded, indicated that retardation of development in the growing stages of the larvæ, as well as in the pupal stage, was the cause of the darkening of colour in the perfect insects; that a low temperature had the effect of causing such retardation; and that growing the larvæ at a forcing temperature tended to produce a warmer and yellower tint in the colouring of the moths. Lord Walsingham, Mr. Poulton, Prof. Meldola, Mr. White, and Mr. Merrifield took part in the discussion which ensued.

Mr. J. H. Leech read a paper "On a small collection of *Lepidoptera* from Kiukiang." Mr. Elwes said he had examined this collection with very great interest, and was struck with the similarity of many of the species to those from Sikkim.—H. Goss and W. W. FOWLER, Hon. Secretaries.

OBSERVATIONS ON COCCIDÆ (No. 3).

BY ALBERT C. F. MORGAN, F.L.S.

CAUDAL SEGMENTS AND THEIR APPENDAGES.

If reference be made to the female forms represented on Plate II (*ante*), what is usually termed the last or anal segment will be found to have undergone considerable modification as regards shape, in comparison with the other segments, and to be further characterized by marginal fringes and emarginations, as well as by tubular and simple cæcal openings on the disc. I purpose now to consider briefly this remarkable anal segment and its appendages.

Taking first the *Diaspina* into consideration, on the dorsal side of the insect will be found several rows of tubular glands (Plate III, figs. 1, 2), and also around the margin several simple cæcal openings, which, in some instances, appear to have a callous margin as in *Mytilaspis pomorum* (fig. 2). Besides these, there are also some isolated scattered openings on the disc. These may all perhaps be considered as spinning glands, or dorsal spinnerets, which secrete the substance from which the scale is formed. In the *Lecanina* the principal spinning glands will be found on the dorsal margin, at the junction of the thoracic with the cephalic and the abdominal segments, and they consist of round pores or follicles amongst which are two short cone-shaped villi, and between these is a long stout spine (see fig. 5). In the *Coccina* a group of similar spinning glands will be found on the lateral dorsal margin of each of the segments (see fig. 4), amongst which arise, as with the *Lecanina*, two cone-shaped villi (see fig. 8), and from each of these groups on each segment (taking *Dactylopius citri* as a type of this sub-family) emanates a powdery white projection, very noticeable during the life of the insect, and numbering 17 on each side of the insect. These dissolve in alcohol, and leave no trace beyond the glands and villi before mentioned, except on the last (exclusive of the ano-genital ring) segment, where a long spine will be found.

But in addition to these scale-substance secreting glands, whose openings are on the dorsal side of the insect, there will be found on the ventral side in most species of *Diaspina*, but not in all, four or five, and sometimes more, groups of glands which present a different appearance to those above described. They are arranged in groups, each group showing from four or five to twenty or more glands, in each of which appear four or five very minute orifices (see figs. 1 and 2, *v. s. g.*). Targioni-Tozzetti (p. 27) describes them as situated on

the dorsal side, but both Prof. Comstock (p. 282) and Dr. Emanuel Witlaczil (p. 160) refer to them as situated on the ventral side. The latter author very decisively states this to be the case. My own observations confirm this opinion, although I suppose it is not intended to maintain that in life they really open on to the external ventral superficies, but only towards the ventral side, being really situated, as I think, within the insect, and which I suppose prevents them being seen until the insect has been treated with a re-agent. Targioni-Tozzetti and Signoret appear to have been the first to describe these organs as spinnerets, the latter author's term being "filières agglomérées," and Dr. Witlaczil seems also to suppose that they secrete the scale-making material, for he says (p. 160), "Nach dem Auseinandergesetzten ist es wohl ziemlich sicher, das wir es hier auch mit einer Art von Wachsdrüsen zu thun haben, wen auch ihre Aufgabe nicht aufgeklärt ist." Prof. Comstock describes them as "spinnerets," and finally Mr. Maskell, in his "Account of New Zealand scale-insects," adopts the same designation.

It is only after prolonged consideration, that I now venture to offer a suggestion as to the functions of these glands, which is at variance with the opinions of the distinguished authors whom I have mentioned. It appears to me that these glands are not used for the purpose of secreting the scale substance, but that they are analogous to what Burmeister (Man. of Ent. Shuck. transl., pl. xxii, figs. 6 and 7) terms "ventral salivary glands," and I think that they are intestinal glands with digestive functions analogous to what in animals are termed the glands or crypts of Lieberkühn. I will now endeavour, as far as I am able, to establish the reasons for arriving at that conclusion. I may mention first that Comstock (p. 282) significantly mentions in a foot note referring to these ventral grouped glands, that he has observed "similar compound spinnerets near the base of the oral setæ in several species." I think it may reasonably be concluded that these organs near the base of the oral setæ were the submaxillary salivary glands, which have been well described and figured by Dr. Mark in his "Beiträge z. Anat. und Hist. d. Pflanzenläuse insbesond. d. Cocciden." The similarity, therefore, of these salivary glands with the ventral grouped glands as mentioned by Comstock is suggestive.

If, on the other hand, these ventral glands were used for secreting scale-substance, it appears to me that they would open on the dorsal superficies of the insect, because the insect lies underneath its scale, and also one might expect that all the species which spin scales would be provided with these organs. But this is not the case; for instance

among the *Aspidioti*, there are *A. rapax* (= or closely allied to *A. camelliæ*), *A. perniciosus*, *A. aurantii*, *A. tenebricosus*, all of which are without these glands, and yet they spin scales almost precisely similar to those spun by species such as *A. nerii*, *A. convexus*, &c., which are provided with four groups. Indeed, Comstock mentions (p. 295) that "*A. convexus* very closely resembles *A. rapax* in the shape and colour of its scale." He says, "the resemblance of the two species is so great, that at first I considered them identical." But it must be remembered that some species secrete what Prof. Comstock (p. 281) terms a ventral scale, indeed, in all instances that I am aware of, as Dr. Witlaczil also remarks (p. 159), a white, thin, slimy-looking film will generally be found remaining on the plant after the insect is removed, although I do not think this can be considered analogous to the true filamentary dorsal scale, for it more resembles a stain where the insect has been fixed, being of its precise shape and size. Sometimes, however, the insect is enclosed in what Comstock terms an "entire" ventral scale, which, however, appears to consist in a great measure (as he suggests) of the ventral half of the rejected larval skin. In any case, these "ventral grouped glands" do not seem to have any relation to the ventral scale, because, for instance, both the species *A. rapax* and *A. aurantii* have well developed "entire" ventral scales, and yet they have no grouped ventral glands; whilst, on the other hand, *A. nerii* has four groups of ventral glands, and yet has no ventral scale, except the white film before referred to. I should now mention that these groups of ventral glands are never found on the male, and as a rule on the female only when it has arrived at maturity. I have occasionally, but very exceptionally, found them on an immature female. Having been termed by authors "spinnerets," they have been considered as analogous to the dorsal spinnerets found on the lateral margins of the dorsal segments of both sexes of some species of the *Coccina* sub-family, e. g., *Dactylopius cyperi*, described by Dr. Signoret (p. 348), and in *Dactylopius citri*, as shown in fig. 4, but these, as I have before mentioned, are true dorsal spinnerets, and cannot, I think, be correctly compared with the ventral grouped glands now under consideration. To find organs analogous to these in the *Coccina* and *Lecanina*, a close examination must be made towards the ventral surface in the adult female, in the neighbourhood of the ano-genital organs, and in the species *Lecanium oleæ* for instance, there will be found glandular organs such as are shown in fig. 6, v. s. g., likewise in *Dactylopius citri* they will be found within what has been termed the ano-genital ring, as shown in fig. 7, although they seem

much smaller in the *Dactylopius* than in the *Lecanium*. In neither of these instances are they arranged in groups, but then in some species of *Diaspina*, in *Leucaspis pini* for instance, they are arranged not in groups, but in the form of a semicircle around the vaginal opening.

It may perhaps be suggested that if these ventral glands are intestinal with digestive functions, they could not be situated, as often appears the case (see fig. 2), below the anus; but this, I think, is only an appearance arising from a misconception of the true last segment, and which will be explained by my subsequent remarks upon this segment. I have mentioned that these glands are not found on the males, but this is not surprising, knowing that the functions of the winged male are purely sexual, and that it has no mouth organs, and only an atrophied abdomen. Lastly, I think it is not unusual for the larva to be of less elaborate structure than the adult, which will explain the reason of the organs being peculiar to the adult, and just as the larva does not show such an elaborate completion of parts as the adult, so perhaps we should not be surprised at finding some few species of the *Diaspina* which are not provided with these ventral grouped glands. Having now suggested what appears to me to be the true nature of these grouped glands (*glandulæ agminatæ*), I propose to offer a few remarks upon that part of the insect which has been termed the last or anal segment.

Perhaps the first and most obvious peculiarity of this segment which is apparent to the student, is the remarkable variation in the position of the anus appearing to violate the general zoological principle as to its position. Prof. Comstock (p. 283) of course noticed this, saying, "its apparent position is represented in the figures, and as will be readily seen, varies greatly in different species." In the two species which I have selected for illustration (see figs. 1 and 2), the position of the anus will be seen to be abnormal. Instead of being at the apex of the segment, in one case (fig. 1) it appears on the disc, and in the other case (fig. 2) it is at the base of the segment.

Now it seems to me that by observing the position of the anus we should be directed towards a correct conclusion as to the position of the true apex of the last segment, and this, I think, will lead to a more accurate comprehension of the correct limits of this segment. I should first mention that the part of the abdomen shown in figs. 1 and 2, as containing segments vii to xi, has hitherto been considered as the last or anal segment, and it will be seen that on this part only are the spinning glands, as regards the *Diaspina*. Perhaps it is the waxy nature of the scale substance continually exuding from this part

which has had a material effect upon its composition, for whilst it is of a different colour to the remaining part of the body, being usually of a bright yellow colour, it also (as Comstock has observed) appears to have become chitinized, and it preserves its characters so well, that even after a specimen has been kept a year or two in the cabinet, it still affords all the characters required for specific determination. I am now going to suggest that this part of the abdomen, in the *Diaspina* sub-family, consists really of five segments much modified in shape, and of which the divisional lines have become suppressed, and I will endeavour to point out the circumstances which have finally led me to this conclusion.

If the insects are examined alive and in different stages of microscopical preparation, very frequently traces of the obliterated somital divisions will be found, and perhaps the best instance for observing this will be found on examination of the second stage of *Leucaspis pini*, as shown in fig. 3. In this species the lower part of the abdomen will be found to be, as is usually the case with the *Diaspina*, of a bright yellow colour, easily distinguished from the remaining part of the insect, which in this species (*second stage*) is of a dark brown, almost black colour, and the yellow part when examined is found to consist of five segments, as shown in fig. 3. Indeed, if this part of the abdomen were considered as one segment only, it would be difficult in most species of *Diaspina* to understand what had become of the remaining segments, in order to make up the normal number of eleven, or even of nine, as a reference to Signoret's artistic figures will I think show (see also plate ii, Ent. Mo. Mag., vol. xxv).

Doubtless it is by no means unusual for the last few abdominal segments to have become much modified in many insects, and rendered subservient, as it were, to the genital organs, but I believe that usually traces of the missing segments can be found, although not always externally. This is shown in the allied family of *Aphides* by Prof. Huxley in his "Agam., Rep. and Morph. of the Aphis" (Trans. Linn. Soc., vol. xxii, pl. 39), and I have found that remarkable species *Cerataphis lataniæ* (described and figured by Mr. Buckton in his "Brit. Aph.," vol. iv, p. 198, pl. 134) useful for comparison as to last segment, whilst the aculeate insects of course afford good examples of modification of the terminal segments. Targioni-Tozzetti appears to have recognised to some extent this last segment modification amongst the *Lecanina* sub-family, for he terms the "anal cleft," which is characteristic of this sub-family, "the caudal," whilst he describes the terminal lobes as the "precaudal segment" (see his fig. 30, tab. 1).

It appears to me that the marginal spines will often assist in determining the somital divisions, and I will now endeavour to trace out the complete number of abdominal segments in the three sub-families of the *Diaspina*, *Lecanina*, and *Coccina*.

As types of these sub-families I take by way of illustration, as before, *Aspidiotus nerii* and *Mytilaspis pomorum*, *Lecanium oleæ*, *Dactylopius citri*, as shown in figs. 1, 2, 4 and 5. Figs. 1 and 2 represent the abdominal segments only, drawn from the dorsal side, but partly diagrammatic, in order to show the ventral grouped glands before referred to. In fig. 2 (*Mytilaspis pomorum*), which is more highly magnified than fig. 1, I have traced where I suppose the segmental divisions would occur; but in fig. 1, I have drawn this part of the abdomen as it actually appears in a properly prepared specimen.

In fig. 5 (representing *Lecanium oleæ*) the first six abdominal divisions are drawn as they are found in Nature, the eleventh or last segment being represented by the anal cleft, and that which is termed by Targioni-Tozzetti the "precaudal segment," appears to me to contain really four rudimentary segments, as indicated by the marginal spines. It will, therefore, be seen that in the *Lecanina*, as in the *Diaspina* sub-family, the last five abdominal segments have undergone considerable modification. These segments, including the eleventh or "anal cleft," are shown more highly magnified in fig. 6.

In fig. 4 (representing *Dactylopius citri*) the first eight abdominal segments are drawn as they are found in Nature, and the ninth appears to me to contain really three segments telescoped into one another, as shown in figs. 7 and 8, each segment having a spine on its margin, and so constituting what has been termed the anogenital ring with six hairs, and which, when the insect is mounted with "pressure," presents the appearance more or less of fig. 7. These six anal spines during the life of the insect appear as two waxy processes joined together protruding from the anus. The secretion with which they are agglutinated differs from the powdery secretion of the other segments, and it may be observed proceeding in the form of a bubble from the end of these six agglutinated hairs, like the honey-dew of the *Aphis*. I had not observed this until I read Mr. Maskell's interesting work before referred to.

Having now glanced at the terminal segments of the genus *Dactylopius*, it will be more easy, I think, to comprehend the nature of my suggestion that a similar manner has been adopted by Nature of modifying the corresponding segments of the genera *Aspidiotus* and *Mytilaspis*, as shown in figs. 1 and 2, as well as in the other genera of the *Diaspina*. On referring to figs. 1 and 2, it will be seen that the marginal lobes appear to be in fact the lateral terminations of each segment, whilst the emarginations or incisions seem to be the openings of the marginal simple secreting glands, which are usually each accompanied by an adjacent plate (*squame*). Each segment shows a spine, as will be observed in both figures, so that what Prof. Comstock has termed lobes, spines, and incisions, become important characters,

and this would seem to confirm the correctness of his views in attaching great importance to the position of these in the differentiation of species, although he also, for this purpose, relies partly on the number of groups of ventral glands, which no doubt form an important feature. It will be seen that the last five segments have become so much compressed that the real last segment appears almost vertical, with its apex at the top, and at the bottom the two lobes which represent the true lateral margins of the segment, the anus always of course being situated at the apex of the segment. I may mention that the views I have here expressed as regards the supposed terminal segments, I have confirmed by actual observation, so far as *Mytilaspis pomorum* is concerned; but to do this, it is necessary to examine the insect in many different moments of preparation, as well-prepared microscopical specimens seldom afford the required evidence of suppressed segments. These are more difficult to find in *A. nerii*, although in this, as in many species, I have traced very suggestive lines.

The points which I have ventured to bring forward in this paper may be summarized as follows:—

- (i). That all the spinning glands of the *Coccidæ* are situated on the dorsal margin, and consist usually either of tubular glands, simple cæcal openings, or follicles interspersed with cone-shaped villi.
- (ii). That what have been termed “grouped spinnerets” are probably ventral salivary glands, or intestinal glands, possibly analogous to the Lieberkühn glands or crypts found on the intestines of animals.
- (iii). That what has been termed the last or anal segment, really contains five rudimentary segments in the *Diaspina*, and that similar modifications of the terminal segments are found in the *Coccina* and *Lecanina* sub-families.
- (iv). That what have been termed caudal appendages, consisting of lobes, spines, and emarginations, are all indications of the boundaries of suppressed somites.

I may mention that the works referred to in this paper are:—

Essai sur les Cochenilles, par Dr. Signoret (separate edition).

First Report to the U. S. A. Dept. of Agriculture, by Prof. Comstock.

Zur Morphologie und Anat. d. Cocciden, von Dr. Emanuel Witlaczil.

Studii sulle Cocciniglie, Prof. Targioni-Tozzetti.

Account of New Zealand Coccidæ, by W. M. Maskell.

And when referring to any of these authors by name, I have merely mentioned the pages of their work.

EXPLANATION OF PLATE III.

Fig. 1.—Abdomen of *Aspidiotus nerii*, ♀ —about $\times 200$.

v. s. g., ventral salivary glands.

„ 2.—Abdomen of *Mytilaspis pomorum*, ♀ —about $\times 300$.

„ 3.—Second stage of *Leucaspis pini*, ♀ — $\times 50$.

„ 4.—*Dactylopius citri*, ♀ —about $\times 20$. *c*, spiracles.

„ 5.—*Lecanium oleæ*, ♀ (not adult) — $\times 40$.

a, thoracic segments; *b*, abdominal segments; *c*, spiracles.

„ 6.—*Lecanium oleæ*, adult ♀, last five abdominal segments (much magnified).

„ 7.—Anogenital ring of *Dactylopius citri*, ♀ (much magnified).

„ 8.—*Dactylopius citri*, ♀, last five abdominal segments (much magnified).

Villa Nova de Gaya:

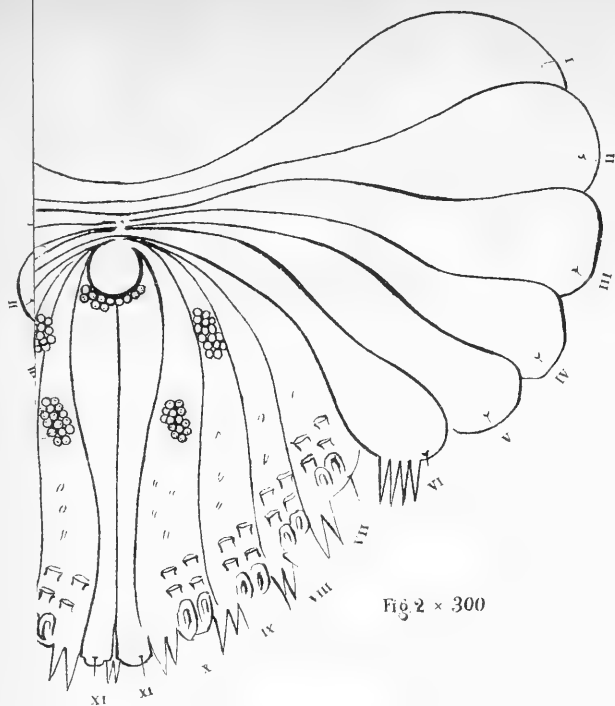
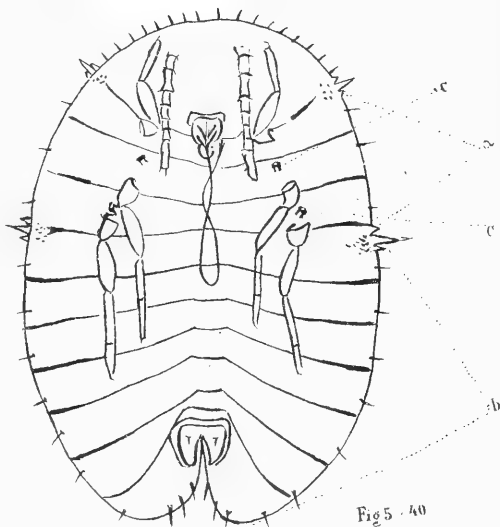
September, 1888.

A REJOINDER ON *RETINIA POSTICANA*, ZETT.

BY W. WARREN, M.A., F.E.S.

“A man convinced *against his will*,
Is of his own opinion still.”

It is just because I wish to convince Mr. Barrett *with his will*, that I am making the accompanying comments on his paper in this month's number of the Ent. Mo. Mag. (p. 181), and I will take the question of Zetterstedt's *posticana* first. I have not the least doubt in my own mind that Zetterstedt's insect, whether specifically distinct from *turionella*, L., or not, is identical with what Mr. Barrett calls the *Scotch* form of it: if either Mr. Barrett or dame Nature herself can squeeze another intermediate species in here, it will be a very tight fit. After quoting Heinemann's distinctions, Mr. Barrett says “the two forms are proportionately most accurately the same in shape of fore- and hind-wings.” Now, if he will measure the distance from the anal angle of the fore-wing of *turionella* to the nearest point of the costa, reckoning this distance as the width of the wing, he will, I think, find that the average *turionella* is quite three times as long as broad in the fore-wing, and *posticana* not more than two and a half times: to my eyes the greater comparative length in *turionella* is evident at a glance; and when Heinemann states that the hind-wings are narrower and more pointed in *turionella*, he should have added “in proportion to their breadth.” Similarly the greater proportionate length of costa in the fore-wing seems to have given him the idea that it was actually straighter, which it certainly is not. In the hind-wing, however, the sinuous indentation below the apex in *turionella* is, *pace* Mr. Barrett, decidedly greater, thus making the apex *appear* more pointed, and by reason of its greater comparative length making the whole hind-wing *appear* narrower.

Fig 2 $\times 300$ Fig 5 $\cdot 40$

F1

Fig. 6

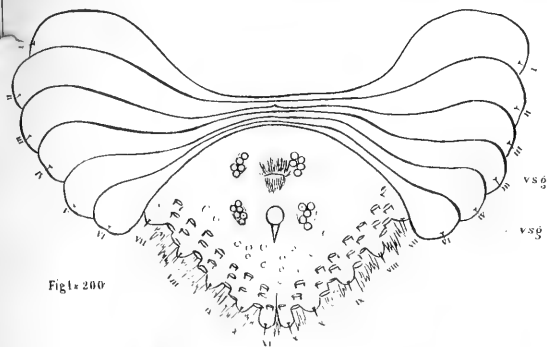


Fig. 200

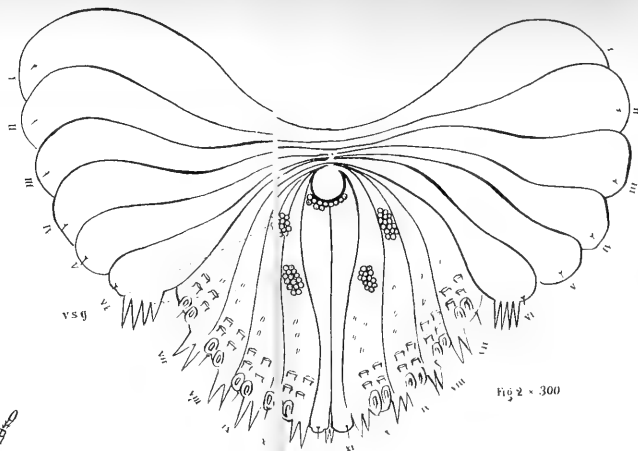


Fig. 2 x 300

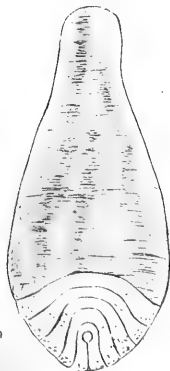


Fig. 3 x 50

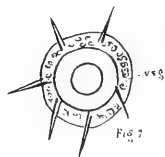


Fig. 7

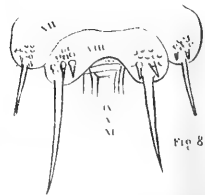


Fig. 8

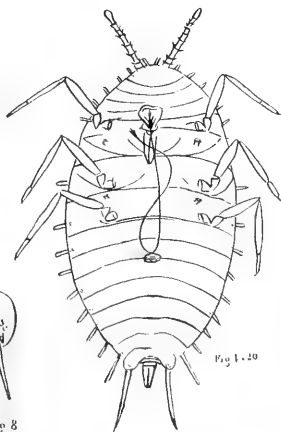


Fig. 1 x 20

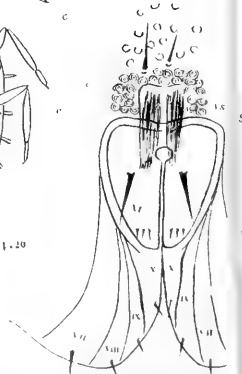


Fig. 6

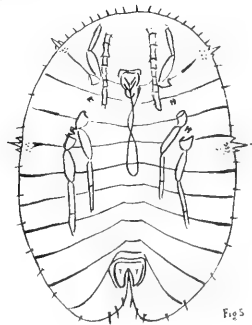
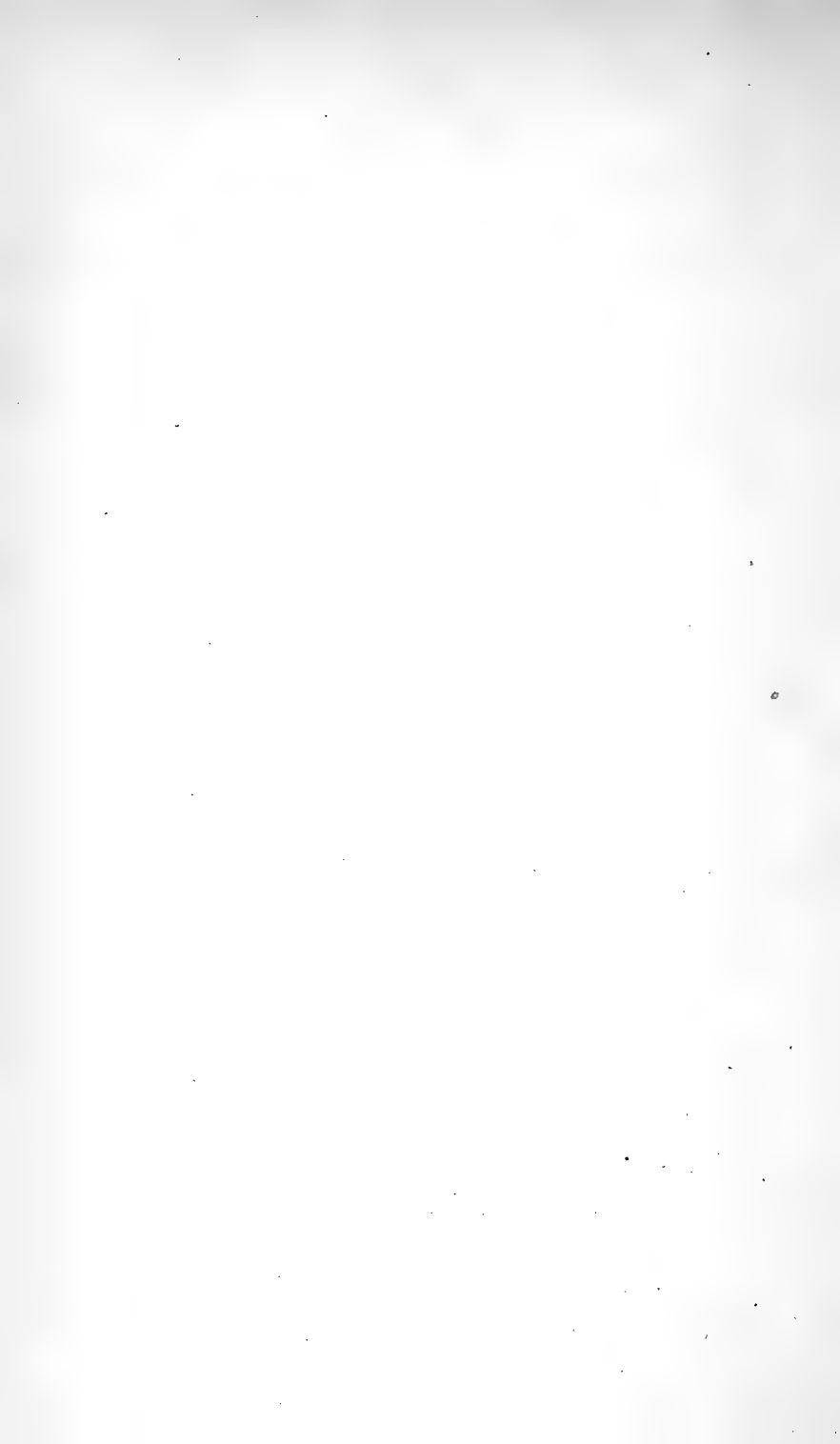


Fig. 5 x 40



But to come to Mr. Barrett's own experience. He says that "he reared a considerable number some years ago from Surrey larvæ, of which he still has *about a dozen*. Of these dozen, 'most' (that is 10) 'are of the full size; one *hardly* larger' (but still larger) 'than the Scotch form; and one intermediate.'" Is this percentage of smaller forms an unusual one? Is it sufficient to warrant Mr. Barrett in saying further on "it appears that these forms from Surrey are *variable in size?*" Of 13 *turionella* (all bred) in my own cabinet, only one (a ♂) bred last year from a separate locality, is below (and not much below) the average size; and certainly a comparison of the series of *turionella* seen in other collections does not induce me to consider it a species *given* to vary from its average size, at least, never *down to half its size*, which is the expanse of wings assigned by Mr. Barrett himself to the Scotch form.

Of all these forms examined by Mr. Barrett, numbering I may take it as many as two dozen, all but one were only half the size of *turionella*, and that one, *to the best of Mr. Barrett's recollection*, a very *curious* one, different from any others he has seen, and *as large as turionella itself!* Now, for the purpose of my argument, I am not bound, I think, to include this specimen (*not bred, curious in appearance*) among the rest; but, supposing it included, the fact still remains, that *on the average* the examples of the Scotch form are, in point of size, no more variable than, nor even half so variable as, the southern form. But Mr. Barrett says "they are *fairly* constant in their small size." He has only, by his own confession, seen *one* big one.

Next, as to the extent of the rusty coloration of the fore-wing, I cannot agree with my friend's conclusions. Of the thirteen specimens before me, all but one, the above-mentioned ♂ of last year's breeding, have more or less of the rusty tinge up to the base, certainly always over the full apical half, of the wing, so that it is not correct to say that the southern form is variable in colour; by far the greater proportion of examples are rust-coloured—why else does the imago seek protection by resting on the brown buds? The forms in which the rust colour is confined to the apex, or apical half, as in Mr. Barrett's two Lynn specimens, and in my single ♂, are *exceptions* to the average coloration. On the other hand the Scotch forms never show any rust colour beyond just the apical third, none at least that I have seen; indeed, if the two species are inspected at a distance of a yard or so, the contrast between the rusty-coloured *turionella* and the rusty-tipped *posticana*, with its dark basal two-thirds, is singularly striking.

Next, let us take the hind-wings of the two forms. Mr. Barrett

speaks of *one* out of Salvage's seven specimens having the basal portion decidedly paler, that is, I may take it, *one* only out of twenty-four, and of the others as variable in depth of tint; but I do not think Mr. Barrett will venture to deny that the darkest hind-winged ♀ of the southern form is over its whole surface, and especially in its basal portion, lighter than the lightest specimen of the northern. In connection with this point, I wish to draw attention to a fact I had not noticed before. If the pale lilac-grey streaks of *turionella* be examined through a glass, they will be found finely freckled with minute darker points, which, while they tone down the pale streaks, never interfere with their distinctness, or make it difficult to distinguish between the darker ground colour and the paler transverse markings; but in the Scotch form the whole basal two-thirds of the fore-wing is thickly sprinkled with irregular dark grey or blackish atoms, which cause the markings to seem to run one into another, and, in fact, give the insect its obscure appearance, and these dots may also be observed in fewer numbers in the rusty apical third. Nor are they confined to the fore-wings, it is to this same sprinkling of dark grey atoms that the hind-wings owe their dulness; whereas, in *turionella* ♀, though the hind-wings are always darker than in the ♂, the dark scaling is confined to the marginal areas, the basal portion merely *appearing* more opaque, without actually possessing any dark scales.

Over and above all these differences, *the fringe of the hind-wings*, except just at the apex, is in *turionella*, both ♂ and ♀, *always white*, *never* in the Scotch form. Mr. Barrett says *whitish*; compared with *turionella* they are *grey*.

Now for Mr. Barrett's conclusion. He goes on to say, "the only distinctions which Mr. Warren specifies for *posticana* are 'the smaller size' and 'the colour of the hind-wing;' but as I (Mr. B.) have shown, *southern turionella vary down to the same size*, and there is *no constancy in the colour of their hind-wings*." Mr. Barrett has *not* shown either: out of twelve bred *turionella*, he has *one nearly as small* as *posticana*, *one* intermediate, *ten* of the full average size; and I affirm that the lightest hind-winged specimen of the northern form is always darker than the darkest ♀ of the southern, and never has white fringes to the hind-wings, which *turionella* always has.

Finally, of the two difficulties which my friend Mr. Barrett finds facing him, I can only say, that I hope to keep up the reputation in which he is pleased to find the first; and of the second I will make him a present, for Mr. Salvage's belief *may be* wrong, and, if *right*, proves nothing—a full-fed larva, accidentally ejected from its home in

the fir shoot, would no doubt spin up where most convenient. But there remains a third difficulty, which apparently Mr. Barrett has not noticed. He argues all along about these *Scotch* forms. My two Newmarket specimens, by which my attention was first directed to the subject, are not *Scotch*; so that the argument drawn from the marvellous variations observable in other Scotch insects falls to the ground. Is it not odd that, if the Scotch insect is merely a form of *turionella*, it should occur unchanged 50 miles south of where Mr. Barrett has found *turionella* with even whiter hind-wings than in its Surrey haunts, and barely more than 50 miles north of those haunts themselves?

13, Cheyne Row, Chelsea, S.W. :

January, 1889.

[Mr. Warren has obligingly given me the opportunity of looking over this paper before it goes to the printer, and of thus adding a few words.

I am unable to find the differences in the form of fore- and hind-wings of which he speaks. To my eye there is no appreciable difference between southern and northern specimens in this respect. I should judge that the proportion of specimens obtainable in the south, of the small size of those from the north, is extremely small. The same may be said with reference to the analogous case of *Xpsipetes elutata*.

The obscuration of rusty colouring, and, indeed, of all light colouring, by the substitution of black scales, is so familiar and usual a process in higher altitudes and latitudes, that I really wonder that it should be brought forward as a specific character. It is especially observable in the fore-wings of *Xylophasia polyodon* and *Noctua glareosa*, and in the hind-wings in *N. xanthographa*, not to mention the paramount instance of the constant black variety of *Amphidasys betularia*.

It did not occur to me to make any remark with reference to the two specimens of the dark form obtained by Mr. Warren at Newmarket. I do not know the exact conditions under which they were found, but the case seems to me analogous to that of the sudden extension southward of *Mixodia rubiginosana* (*Boucardana*), which is reasonably supposed to result from the extensive planting of young fir trees obtained from Scotland. It could not be expected that their dark colouring would disappear immediately.—C. G. B.]

NOTES ON CERTAIN SPECIES BELONGING TO THE GENUS
CEUTHORRHYNCHUS, GERMAR.

BY THE REV. CANON FOWLER, M.A., F.L.S.

In the volume of the "Faune des Coléoptères du bassin de la Seine," *Rhynchophora*, lately published by M. Bedel, he separates the two species, *C. cardui*, Herbst, and *C. fuliginosus*, Marsh., which have usually been regarded as synonymous, as follows:—

Head with a little stria between the eyes; thorax with a lateral raised ridge, rather strongly developed, and continued to the external margin, if viewed from above..... *C. cardui*, Herbst.

Head without an interocular stria; thorax with a small tubercle, which, if viewed from above, appears to be isolated, and not continued to external margin...

C. fuliginosus, Marsh.

I shall be glad to know if any Coleopterist has these two species or varieties strongly marked in his collection; as far as I have been able to judge, intermediate forms occur, and the species certainly do not seem to be distinct; the insect regarded by British Entomologists as *Caliodes fuliginosus* is very common in Lincoln, on pavements, from early spring to autumn.

One of the great difficulties of the genus *Ceuthorrhynchus* is the *C. marginatus* group, which contains *C. marginatus*, Payk., *C. punctiger*, Gyll., *C. rotundatus*, Bris., and *C. distinctus*, Bris.; *C. distinctus* belongs to the section in which the funiculus of the antennæ is composed of six joints (*s. g.*, *Ceuthorrhynchidius*, Duval), but otherwise it very closely resembles *C. marginatus* and *C. punctiger*; these two latter species are distinguished as follows by M. Bedel:—

Thorax rather convex, covered with small and extremely close circular punctures; elytra convex, not at all asperate at sides; apex of pygidium with a deep incision in both sexes *C. punctiger*, Gyll.

Thorax sub-depressed, shagreened; elytra sensibly depressed in front, finely asperate towards the sides; pygidium foveolate behind in the male, entire in the female *C. marginatus*, Payk.

C. punctiger occurs on *Taraxacum officinale*, and the larva of *C. marginatus* has been found by Dr. Giraud on *Hypochæris maculata*; the habits of *C. distinctus* have not been observed.

I have never seen *C. rotundatus*, which is described as near *punctiger*, but of shorter form and greater convexity, with relatively wider striæ, and its pygidium not deeply excised; it seems, therefore, in some ways to form a connecting link between the two species; it has only been recorded, as far as I know, as taken in this country by

Mr. Crotch, near London ; M. Bedel appears to make no allusion to it, and I should be inclined to regard it as merely a form, and not a separate species.

C. viridipennis, Bris., which has been included in our catalogues, appears now to be dropped ; it was said to come near *C. chalybæus*. Dr. Sharp omitted it from the second edition of his catalogue, and M. Bedel does not refer to it.

C. quercicola, Bris., and *C. versicolor*, Bris., which are given as separate species in the last European catalogue of Heyden, Reitter, and Weise, cannot be regarded as distinct ; and *C. Crotchii*, which is also separated in the same catalogue, appears to be merely a variety of *C. quercicola*, with the thorax somewhat more depressed, and the tarsi testaceous, and furnished with smaller claws.

C. Chevrolati, Bris. (*minimus*, Walker, ?), is not mentioned by M. Bedel ; I have a specimen given me by Dr. Power, which at first sight seems very distinct from *C. troglodytes*, of which it has been regarded as a variety ; it is, however, smaller, and the pubescence is quite different, although structurally it much resembles the last named species.

C. nigroterminatus, Woll., appears to be probably identical with *C. mixtus*, Mulsant and Rey, although M. Bedel regards the synonymy as somewhat doubtful.

With regard to the classification of the tribe *Ceuthorrhyncina*, M. Bedel makes a radical alteration, as he includes all the usually received genera under three, *Amalus*, *Mononychus*, and *Ceuthorrhynchus*, which he separates as follows :—

I. Prosternum at least as long before the anterior coxæ as the coxa itself, and deeply incised at throat.

i. Onychium terminated by a single claw ; scape half as long as the funiculus *Mononychus*.

ii. Onychium terminated by two claws (simple, dentate, or appendiculate) ; scape usually as long as the funiculus *Ceuthorrhynchus*.

II. Prosternum reduced before the anterior coxæ to a narrow border, and truncate or broadly emarginate in an arc on its anterior margin *Amalus*.

Of these genera, *Mononychus* stands by itself ; *Ceuthorrhynchus* includes *Caliodes*, *Poophagus*, *Ceuthorrhynchus*, *Ceuthorrhynchidius*, *Tapinotus*, and *Rhytidosomus* ; and *Amalus* comprises *Rhinoncus*, *Amalus*, *Eubrychius*, *Litodactylus*, and *Phytobius*. I am strongly inclined to follow M. Bedel in this arrangement, but am somewhat doubtful as to the true position of *Amalus* proper, containing the two

European species, *hæmorrhous*, Herbst. (*scortillum*, Herbst.), and *alpinus*, Hampe; this genus, by reason of its longer rostrum, approaches rather nearer *Ceuthorrhynchus* than is the case with the rest of the sub-genera, and is somewhat intermediate between the latter genus and *Amalus*, as characterized by M. Bedel; in the formation of the prosternum, however, it is closely allied to *Rhinoncus*, and if we include it under that group, the name *Amalus* must be adopted for the whole, as it was published by Schönherr in 1826, and precedes *Rhinoncus* and *Pachyrrhinus* by five years, and *Phytobius* by ten years.

At present the genera of the *Rhynchophora* are by no means settled. M. Bedel's work is the most valuable contribution to their classification that has appeared for a long time, but a very great deal more work requires to be done before we can be said even to know the outlines of the group as a whole; students of the *Curculionidæ* must, therefore, be prepared to find their notions regarding the genera entirely upset.

I may add that I shall be extremely obliged to any collector who will furnish me with localities for any of the rarer species of *Rhynchophora* occurring in Britain.

Lincoln: November 15th, 1888.

DESCRIPTION OF A NEW SPECIES OF NEOTROPICAL CAPSIDÆ.

BY W. L. DISTANT, F.E.S.

My friend, Mr. McLachlan, has forwarded some specimens of *Capsidæ* (received by him from Mr. D. Morris, Assistant Director of the Royal Gardens, Kew) to me for determination, which he states are—in a living condition—doing much damage to orchids in the Botanic Gardens at Trinidad. On examination, these prove to belong to the genus *Eccritotarsus*, and to apparently represent an undescribed species, the diagnosis of which is here appended.

ECCRITOTARSUS EXITIOSUS, n. sp.

Head and thorax, above and beneath, and extreme base of corium, sanguineous; scutellum, corium, excluding base, cuneus and abdomen beneath, shining bluish-black; membrane fuscous, their apices paler; antennæ with the first and second joints black, third and fourth joints luteous; coxæ and legs luteous; apices of the femora and anterior tibiæ, and the whole of the intermediate and posterior tibiæ, dark fuscous or black; rostrum luteous, the base and apex blackish; eyes black.

Long., $4\frac{1}{2}$ mm.

Purley: December 31st, 1888.

DESCRIPTIONS OF SOME NEW SPECIES OF PHYTOPHAGOUS
COLEOPTERA.

BY MARTIN JACOBY, F.E.S.

SAGRA PAPUANA, n. sp.

Metallic cupreous or blue; the last four joints of the antennæ black; thorax subquadrate, scarcely visibly punctured; elytra narrowed posteriorly, the basal portion raised, obsoletely geminate punctate-striate, the interstices transversely wrinkled at the sides, cupreous, a spot near the sides greenish.

Mas: posterior femora scarcely extending beyond the apex of the elytra, strongly widened at the middle, armed with a larger and a smaller tooth placed below near the apex; posterior tibiæ stout, curved, thickly tomentose on their inner surface, with a single stout triangular tooth below the middle, intermediate femora curved at the base; first abdominal segment clothed with fulvous pubescence.

Fem.: posterior femora with a short acute ridge near the apex, their tibiæ strongly curved, unarmed and without pubescence; the first abdominal segment smooth, not pubescent.

Length, 6—8 lines.

Hab.: New Guinea, Port Moresby (collection, Jacoby).

The male of this *Sagra* may be known from most of its allies by the thickly tomentose inner side of the posterior tibiæ and their single stout tooth, also by the comparatively short posterior femora; the thorax is nearly square, the anterior angles are not prominent but rather obtuse, bounded by a short but deep groove within, the surface is either almost entirely impunctate or impressed with very few minute punctures; at the middle of the base a short longitudinal groove is placed; the elytra have prominent shoulders, bounded by a short longitudinal groove, their punctuation consists of double and rather irregular rows, of which the pair within the humerus is more distinct and oblique in direction, the interstices near the sides and apex, and to a less extent on the disc, are transversely wrinkled; the colour varies from metallic cupreous to green or entirely blue; in the cupreous coloured specimens there is a small green patch of more or less intensity, placed on the sides of each elytron.

MEGALOPUS BUCKLEYI, n. sp.

Elongate, strongly narrowed posteriorly, black, the sides of the thorax, parts of the breast and abdomen, fulvous; elytra closely punctured and rugose, a narrow angulate band before, another behind the middle and the apex (with the exception of a black spot), fulvous.

Mas: the posterior femora very large and robust, black above, fulvous below, armed with a small and a very large tooth, their tibiæ very strongly curved.

Length, 7 lines.

Fem.: the elytral bands yellowish-white; the legs feeble and entirely black.

Length, 5 lines.

Hab.: Ecuador.

This species, which was obtained by Mr. Buckley some years ago, and of which I expressed an opinion at the time (P. Z. S., 1880, p. 591) that it might possibly represent a new species, closely allied to *M. armatus*, Lac., must, I think, be considered as such, as a closer examination has proved to me. *M. Buckleyi* differs from *M. armatus* in the following details:—the elytra, instead of being black with a narrow *central* fulvous band; have two fasciæ, one before the other behind the middle, thus resembling the pattern of the female; the apex of the elytra, which in *M. armatus* is black, with a small fulvous spot and finely sericeous, is smooth and fulvous with a black central spot in *M. Buckleyi*; the female of the present species differs also from that of *M. armatus* in having the thorax coloured exactly like the male, that is, black with a flavous lateral margin; the colour of the under-side (flavous, with the sides of the breast and the middle of the abdominal segments black) agrees with that of the allied species. I have, however, never seen a specimen of *M. armatus* marked as pointed out above, and moreover, the *position* of the elytral bands excludes the supposition that the two insects are identical.

DORYPHORA BRAZILIENSIS, *n. sp.*

Obscure piceous; head and thorax testaceous, the former with three the latter with four black spots; elytra dark violaceous-blue, finely and remotely punctured, the lateral margin narrowly testaceous.

var.: elytra entirely pale fulvous or testaceous. Length, $4\frac{1}{2}$ — $5\frac{1}{2}$ lines.

Of oblong and parallel shape, rather convex, the head remotely punctured, with two spots at the base, two near the antennæ, and a central one, black; thorax nearly three times broader than long, the sides strongly rounded before the middle, the anterior margin deeply emarginate behind the eyes, straight at the middle, the posterior margin broadly produced at the middle, the surface remotely but irregularly punctured, the punctures rather deep and closely placed at the sides; scutellum black; elytra finely and not closely punctured, the punctures arranged in irregular rows, the lateral margin and the epipleuræ testaceous, the disc dark violaceous-blue; below obscure piceous, the legs testaceous, stained with piceous; mesosternal process long and pointed; tarsi black.

Hab.: Brazils, St. Catharina (my collection).

Closely allied to *D. fervida* and *D. cincta*, but differing entirely in the punctuation of the thorax and elytra, and from *D. amabilis*, Baly, in the much larger size and colour of the elytra; the pale variety may possibly be immature, but agrees in every other respect with the type.

DORYPHORA PICEOFASCIATA, *n. sp.*

Testaceous; the terminal joints of the antennæ black; thorax transverse, nearly impunctate; elytra strongly convex, punctate-striate, a sutural broad band and

another discoidal band, narrowed anteriorly and posteriorly, as well as the extreme lateral margin, piceous. Length, $4\frac{1}{2}$ lines.

Head impunctate, testaceous; antennæ rather slender, the basal five joints fulvous, the others black; the three terminal joints distinctly longer than broad; thorax three times broader than long, the sides straight at the base, but slightly rounded in front, the surface, with the exception of a few fine punctures near the base, impunctate, pale fulvous; elytra not widened towards the middle, finely punctate-striate, the striæ placed at irregular distances, flavous, the suture with a piceous longitudinal band, extending to the first two rows of punctures, and strongly narrowed at the base, the discoidal band placed between the fourth and seventh striæ, also narrowed at the base, and ending in an acute point near the apex; the lateral margin narrowly black; under-side and legs testaceous; the mesosternal process moderately long, robust, and slightly curved.

Hab. : — ?

This species, of which I possess a single specimen without locality, resembles in the elytral pattern *D. flavovittata*, Stål, but differs in the shape of the dark bands of the elytra, the space between the first two rows of punctures and the third row is very broad, nearly double the width of that between the first two rows, the following rows of punctures are also placed at unequal distances, but the width of the piceous bands and that of the flavous portion is nearly equal.

DORYPHORA BRUNNEO-LINEATA, *n. sp.*

Obscure testaceous; the terminal joints of the antennæ black; thorax strongly transverse, finely punctured; elytra very strongly geminate, punctate-striate, obscure pale greenish, with four pale longitudinal brownish stripes. Length, $4\frac{1}{2}$ lines.

Head with a few minute punctures; antennæ comparatively slender, extending to the base of the elytra, black, the lower four joints testaceous; thorax three times broader than long, the sides strongly rounded before the middle, the anterior margin straight at the middle, deeply obliquely emarginate behind the eyes, the posterior margin slightly rounded, the surface very finely and irregularly punctured; scutellum impunctate, obscure testaceous; elytra regularly convex, pale greenish-testaceous with eight rows of deep and regular punctures (not counting the short subsutural stripe), arranged in pairs, and another single row of punctures near the lateral margin; these double rows of pale brownish colour, the interstices impunctate, pale greenish; beneath and legs obscure testaceous; the mesosternal process nearly straight, short and robust.

Hab. : Brazils, Santa Catharina.

Closely allied to *D. strigilata*, Stål, but differing in the black terminal joints of the antennæ, the much more transversely shaped and finely punctured thorax, and the deeper punctuation of the elytral striæ; the sides of the thorax in *D. brunneo-lineata* are also more strongly widened and rounded, but the elytral pattern is exactly similar in both species.

DORYPHORA UNDULATO-FASCIATA, n. sp.

Broadly ovate, very convex, dark metallic violaceous; the head, antennæ, and thorax black, opaque, finely punctured; elytra flavous, remotely punctured, the sutural and lateral margins, some spots at the base and three undulated transverse bands, before, at, and below the middle, black. Length, 8 lines.

Head finely punctured; antennæ extending to the base of the elytra, black, the lower three joints stained with fulvous below; thorax three times broader than long, the sides broadly rounded, the surface finely and remotely punctured, the interstices also microscopically finely punctate, the sides with a small round fovea, the extreme lateral margin impressed with a row of larger punctures; scutellum black, smooth, impunctate; elytra not wider at the base than the thorax, more strongly punctured than the latter, the interstices finely aciculate here and there, bright yellowish-white, the basal margin with two or three black spots joined together, a transverse band, composed of four united spots, placed before, another similar band below the middle, and a shorter one, abbreviated near the suture and ending in an elongate spot, as well as the sutural and lateral margin narrowly, black; under-side and legs violaceous; mesosternal process strong and curved.

Hab.: Colombia (my collection).

This species, of which I possess a single example, was obtained by the late Mr. Wallis in Colombia; it may be known from *D. Batesi*, Baly, by the fine punctuation of the thorax, which is not visible without a lens, the sides of the thorax are also more strongly rounded in the present species, and the last elytral band does not extend to the suture; *D. nigro-guttata*, Stål, has olive-green elytra, the bands are divided into isolated spots, and do not extend to the lateral margin; *D. procax* is similarly marked.

7, Hemstall Road, West Hampstead:
November, 1888.

IS *SPHECODES* PARASITIC?

BY R. C. L. PERKINS.

Some time ago, in this Magazine, I gave an account of the habits of the bees of the genus *Sphecodes*, Latr., and mentioned certain facts which favour the view that these bees are parasitic on *Halicti*. These facts were simply the result of my own observations in localities very rich in this genus, and I did not then attempt to discuss the arguments brought forward against the parasitic view; now, however, it seems advisable (as I have been able to make the acquaintance of one other rare species) to add a few further notes, and notice the chief observations which have caused the genus to be regarded as an industrial one.

When I began to collect *Hymenoptera* I was not a little surprised that the whole of the *leucozonius* group of *Halictus* appeared to be

totally absent in this neighbourhood, and also the common species of *Sphecodes*, *pilifrons*, Thoms., and *similis*, Wesm. However, as soon as I visited other localities where these *Halicti* occurred, I at once took the above mentioned species of *Sphecodes*; consequently, knowing how other species of the latter genus were always to be found with other species of the former, I came to the conclusion that there must be some connection between them.

Last July I was pleased to find burrowing in the clay, just on the edge of a ploughed field, numbers of *Halictus xanthopus*, Kirb.; at this time they were much worn, being all hibernated females. On the flower heads of *Centaurea*, *Senecio*, &c., they positively swarmed, and around their burrows and in their company I took a short series of *Sphecodes spinulosus*, von Hag., the finest species of the genus. No doubt I could have taken many more, but it was not nearly so plentiful as the *Halictus*. It is a singular fact that, though I have hunted in the same spot in previous seasons, I have never before seen a single specimen of either of these two species. Their occurrence in this way, together, is certainly strongly in favour of the parasitic view.

The prevalent opinion that they are non-parasitic seems chiefly to be founded on the following observations:—first and foremost, *Sphecodes* have been seen to form their own burrow; secondly, they have been noticed in spots where *Halictus* has not; and lastly, *Prosopis* has proved to be no parasite, though many Hymenopterists once regarded it as such, as well as *Sphecodes*.

As to the first observation, I, only the other day, saw *Sphecodes gibbus*, Linn., ♀, forming a burrow in a bare spot in the clay; but this argument can best be met by considering the habits of other parasitic insects. Some, such as *Melecta*, appear to be obnoxious to their host; others, like *Nomada* (at least certain species of this genus), are allowed to enter the burrows of *Andrena*, &c., without hindrance. In May and June, when *Anthophora* is most busy, I take females of *Melecta* commonly, hanging to the asparagus, twigs of barberry, &c., in our garden in the evening and on wet days. They hang down by the mandibles alone, and are very conspicuous in some cases. *Nomada ochrostoma*, Kirb., I take in the same way, but usually on the dry flower-heads of grasses. It assimilates very well with its place of rest, reminding one strongly of *Thanaos Tages* on rush blossom, or *Anthocharis cardamines* on white *Compositæ*, amongst the *Lepidoptera*. Possibly, therefore, this *Nomada* is obnoxious to its host, Smith's *Andrena xanthura*.

In weather such as we have had this year these species are rapidly

decimated by the rain and cold, especially *Melecta*, on account of its thick pubescence, which catches the rain. Now it is hardly probable that *Sphcodes*, if parasitic, would add insult to injury by forcing its presence on its host during all the autumn, winter and summer months, nor could it live through all these months exposed to the weather. It is much more likely that if it could not find an unoccupied burrow of *Halictus*, it would construct one as a shelter for itself.

The other arguments I have given are almost too weak to need a reply; where I have supposed *Sphcodes* to breed away from *Halictus*, close observation has always undeceived me.

I think we may safely presume, that in certain localities at least, *Sphcodes* is a parasitic genus. That it is so always is a matter of doubt; some of our most observant entomologists have never seen any reason to suspect it as such. Possibly it may yet retain the instinct of gathering provision for its young, though glad to lay its eggs on the store of *Halictus*, when opportunity offers.

Sopworth Rectory, Chippenham,
Wilts: September, 1888.

NOTES ON LEPIDOPTERA IN THE SOUTH OF FRANCE.

BY ALBERT H. JONES, F.E.S.

When I left England, on the 28th April, scarcely a vestige of green was to be seen on any of the trees or hedgerows, and it was interesting to watch, as I journeyed southwards, the gradual development of vegetation. On arrival at Hyères, the country presented a similar appearance to our own in June, with an almost tropical sunshine.

On the 3rd May, I started from L'Hermitage, where I was stopping, for an excursion to Carqueyranne. The road passes for a short distance through fir woods, and then along the sea-shore. In the fir woods there was little to be met with beyond occasional *Gonepteryx Cleopatra*. On the outskirts near the sea, this species was common, and so were *Melitæa Cinxia*, *Pieris brassicæ*, *rapæ*, *napi*, and *Daphnidice*, and *Anthocharis Belia*, *Acontia luctuosa*, *Aspilates gilvaria*, and *Rhodaria sanguinalis*.

Along the road by the sea I noticed a few *Colias Edusa* and one var. *Helice*, and *Thestor Ballus*, worn. On arrival at Carqueyranne, I turned inland to a locality marked on the map "Le Paradis," a beautiful spot surrounded by woods. The hill sides were profusely covered with wild thyme, full in blossom, which attracted numberless butterflies. All the species already mentioned occurred, and in addition, the lovely *Anthocharis euphenoides*—not, however, attracted by the thyme, but by the yellow blossom of a plant closely allied to our common charlock, on which it delighted to rest. *A. cardamines*

also occurred, but was scarce. *Thais rumina*, var. *medesicaste*, although very late for it, was still on the wing. *Papilio Podalirius*, *Machaon*, *Leucophasia sinapis*, *Thecla rubi*, *Limenitis Camilla*, *Polymmatas Gordius* (1 only), *Lycæna melanops* and *Baton*, var. *Panoptes* (the commonest Blues), *Astrarche*, *Icarus*, *Argiolus*, and *Cyllarus*, *Spilothyrus alceæ*, *Nisoniades Tages*, *Syrichthus alveus* and *malvæ* were scarce, but *Sao* swarmed over the thyme blossoms. There was not an abundance of moths, and the only species I took of interest was a beautiful specimen of *Micra ostrina*.

I paid one or two visits to the cork woods, to the North of Hyères, and found in certain spots *Lepidoptera* plentiful. On a marshy bit of ground by the side of a stream among *Aristolochia*, *Thais Polyxena*, var. *Cassandra*, was somewhat common, flying, however, only in the very bright sunshine. The eggs of the butterfly were very abundant on this, its food-plant. *Sesia fuciformis* was also common.

On the 5th May, I sailed over to the Island of Porquerolles, a few miles distant from the mainland. The Island was interesting for its wildness: the "bamboo-looking" reeds growing on all the uncultivated ground, adding much to the effect. The only butterflies I noticed were *Pieris brassicæ*, *rapæ*, and *Daphidice*, *Anthocharis Belia*, *Leucophasia sinapis*, *Colias Edusa*, *Gonepteryx Cleopatra*, *Thecla rubi*, *Lycæna Icarus*, *Vanessa cardui*, and *Spilothyrus alceæ*.

I left on the 7th May for Beaulieu, near Nice—well situated for collecting—I noticed the following species not observed at Hyères: *Gonepteryx rhamni*, sparingly, *Lycæna Corydon*, *Bellargus*, *Melitæa Phæbe*, *Spilothyrus althææ* (a few), and one *lavateræ*; *Arctia villica* was not uncommon, and several species of *Acidalie* and *Minoa euphorbiata*. At about 2000 feet, in a treeless region among the mountains, I took three *Leucophasia Duponcheli*; it appeared to be fairly common, but the locality was near a French fortress, and forbidden ground, otherwise I should probably have taken a long series.

On the 14th May, I started for a hurried visit to St. Martin Lantosque, 3117 ft. above the sea, in the Alpes Maritimes. The locality is well known for having furnished so many interesting *Lepidoptera*; I was aware that the middle of May was much too early, especially in such a late season as the present: indeed, only a thousand feet above the town there were vast fields of snow; several species taken low down occurred here; in addition, I noticed *Lycæna semiargus*, *Colias Hyale*, *Argynnis Lathonia*, *Heliodes arbuti*, *Venilia maculata*, &c.

Hibernated specimens of *Vanessa Antiopa* and *Egea* occurred at intervals, the latter usually found flying about buildings.

Shrublands, Eltham, Kent:

December 1st, 1888.

NOTES ON *PSOCUS OBSCURUS*, RAMBUR.

BY HERMAN ALBARDA.

The above-named species, although more than forty years ago described, after a specimen captured near Paris, is yet nearly unknown by entomologists. Perhaps it has been overlooked.

De Hagen, in his "*Psocinorum et Embidinorum Synopsis Synonymica*," recorded it as a "*Psocus*," but Baron de Selys-Longchamps, the owner of Rambur's collection, informed us, in his "*Révision des Psocides décrites par Rambur*," that it was a *Peripsocus*. We have no further information, and the description is insufficient. *Peripsocus phæopterus*, Stephens, being unknown to the author, he compared the insect to his *Ps. subfasciatus*, = *Peripsocus subpupillatus*, McLachlan, and, as M. Kolbe remarks, *phæopterus* and *obscurus* must be nearly allied, but no one knows how to separate them. Baron de Selys was so kind as to lend me the type, and also another specimen discovered by Dr. Hagen, in the collection of Latreille.

The examination of these specimens, and of *phæopterus*, enables me to give the following comparative descriptions:

P. phæopterus, Stephens.

Expanse, 5·2—5·5 mm.

Reddish-brown.

Antennæ shorter than the wings, moderately pilose, blackish.

Head uniformly reddish-brown.

Thorax dark brown, nearly black on the lobes.

Abdomen reddish-brown, darker on the sides.

Legs brown; fore-tibiæ blackish.

Wings more or less dark mouse-grey; veins blackish; pterostigma nearly black.

Pterostigma slightly enlarged towards the apex; a conspicuous black spot at its commencement, another very minute in its external angle, and a third at the inner margin of the wing, at the end of the cubitus.

Posterior-wing a little paler.

P. obscurus, Rambur.

Expanse, 6—6·3 mm.

Cinereous.

Antennæ shorter than the wings, densely pilose, brown, darker towards the apex.

Head cinereous; crown intensely black.

Thorax dark cinereous, blackish on the lobes.

Abdomen fuscous, paler beneath.

Legs cinereous; tarsi fuscous.

Wings pale cinereous, shining, with violet reflection; veins and pterostigma somewhat darker.

Pterostigma broadly enlarged towards the apex; a minute black spot at its commencement; no spot in its external angle; a nearly imperceptible spot at the inner margin of the wing, at the end of the cubitus.

Posterior-wings paler.

Thus, *obscurus* can, by its black crown, far more enlarged pterostigma, and general paler colour, easily be separated from *phæopterus*.

Lceuwarden: December 27th, 1888.

ANTHOMYIA MARSHAMI, STEPHENS.

BY R. H. MEADE.

Some time since I was asked by Mr. T. D. A. Cockerell if I knew the fly which J. F. Stephens had named *A. Marshami* in his Systematic Catalogue (p. 307, No. 8903) ; and could tell him if it was a new species, or one that has been described under some other name. I told him it was unknown to me, but that I would try to find and examine it, if any specimens existed in the collection of the late Mr. Stephens in the British Museum.

Being in London in October last, I went to the Museum, and, by the kind assistance of Mr. Waterhouse, easily found three examples thus named, placed in the cabinet exactly in the situation indicated in the Systematic Catalogue. Upon examination, I ascertained that they were spotted varieties of *Mydæa impuncta*, Fallén, which has been described as a distinct species by Zetterstedt, under the name of *A. demigrans*.*

M. impuncta is a very common fly, and most frequently the abdomen appears to be immaculate ; I therefore placed it in the genus *Mydæa* in my annotated list, but numerous examples have the body more or less distinctly spotted, and when viewed in certain lights, vestiges of spots may almost always be seen on either the second or third segments ; so this species really belongs to the genus *Spilogaster*, founded, and thus defined, by Macquart, "l'abdomen toujours marqué de quatre taches noires, auxquelles le nom générique fait allusion."†

By some modern Dipterists, as Schiner and Rondani, the genus *Spilogaster* has been enlarged, and made to include all those species which I have placed in the genus *Mydæa*, as well as those with a spotted abdomen, to the reception of which it should properly be restricted.

Bradford : November 24th, 1888.

Note on Lycæna Cyllarus.—On comparing the *Lycæna Cyllarus* from Hyères with those I took last year in the Italian Lake District, I noticed a considerable difference both in size and colour. The Italian specimens are larger, the blue in the males approaches in tone that of *semiargus*, the marginal black border is also much broader. The females are of an uniform dark brown. In the Hyères specimens, blue at the base, shaded with brown towards the outer margin. On comparing the specimens with the series in the British Museum Collection, I find that the Italian specimens are var. *tristis*, a form supposed only to occur in Asia Minor.—ALBERT H. JONES, Shrublands, Eltham, Kent : December 1st, 1888.

* Dipt. Scand., T. iv, f. 1699. † Hist. Nat. des Insc. Dipt., T. ii, p. 294.

Note on Leucophasia Duponcheli.—There appears to be confusion made by some British authors between *Leucophasia sinapis*, var. *lathyri*, and *Leucophasia Duponcheli*. Lang's figure of the under-side, and his description of the upper-surface of this latter species are correct. It is widely separated from *sinapis* and all its forms by its narrower and more pointed wings; it is also a smaller insect.—ID.

On the interbreeding of Zygæna trifolii and Z. filipendulæ.—With reference to Mr. Meyrick's remarks on *Zygæna filipendulæ* (*ante* p. 184), and its possible interbreeding with a five spot Burnet, there are, of course, one or two *Zygæna* of narrow range that have both five and six spot forms, and with a dominant species like *filipendulæ*, it may be that it finds it can maintain its struggle more advantageously in some districts in a five spot rather than a six spot form.

A few years ago, however, when collecting in Switzerland and Piedmont, we came to the conclusion that *trifolii* and *filipendulæ* had been interbreeding, and I drew attention to this in Vol. xxi, p. 9, of this Magazine. In a walk from the Hospice of the Great St. Bernard to Aosta, we found in the Bultier Valley these two species in remarkable abundance, with transitional forms from one to the other in all grades. I remember in one field in particular nearly every scabious head of flowers, which were in great abundance, was tenanted by these insects, and frequently two or three on one head; it was in this field that we procured our most remarkable varieties, several of which I described in the paper referred to.

Both *trifolii* and *filipendulæ* were in equal abundance in this special place, and we were thus forced to the conclusion that there was not only a possibility, but a strong probability, that crossing had taken place.—G. T. BAKER, 16, Clarendon Road, Edgbaston: *January 11th*, 1889.

Note on the food-plant of Cosmopteryx orichalcea.—In reference to the North German food-plant of this insect, I find it is not *Festuca arundinacea*, as we had hitherto thought, neither is it *Anthoxanthum odoratum*, but it is certainly *Hierochloë odorata*.

This grass, after its blooming time (during which it remains quite small) is over, has, in common with some other grasses, the peculiarity of pushing out very long leaves in the autumn. The larva mines in these long autumnal leaves, preferring those plants which are sheltered by bushes, just as *C. Lienigiella* and *Scribaniella* frequent only those plants, which cannot be easily cut down.

My stock of *Hierochloë* being exhausted, I offered leaves of *Milium effusum* to some young larvæ of *C. orichalcea*, having been led to the choice of this grass by its similarity of scent to *Hierochloë*. To my delight the young larvæ bored in it and fed just as if they had leaves of *Hierochloë*.

I am told that Coumarin is the cause of the delightful scent of both grasses, as also of woodruff (*Asperula odorata*).—E. HERING, Berlin, N. W., Invalidenstrasse, No. 43.—*January*, 1889.

[*Hierochloë* is a very rare British plant. Sowerby informs us that in Prussia it is used to strew about Churches on high festivals on account of its agreeable scent. The food-plant for *C. orichalcea* given by Büttner in his "Notes on Stettin Micro-

Lepidoptera" (Stett. Ent. Zeit., 1880, p. 461) is *Festuca arundinacea*; for this I suppose we must now read *Hierochloë odorata*. Mistakes will sometimes occur in the names given for grasses by Entomologists, who are apt to make their acquaintance when not in blossom. I speak on this point from experience.—H. T. STANTON.]

Note on Acidalia immorata.—This insect seems to have established itself in the usual south-east corner of our island: I hope permanently. It is a lively, pretty insect, with much the habit of *Strenia clathrata*, and is very common in Switzerland; one afternoon, in the beginning of July, I saw dozens of them flitting about over a large patch of lucerne, between St. Nicholas and Zermatt. Has *Aplasta onomaria* died out? or is it only that the captures of it are not now recorded? *A. immorata* cannot be very particular about its food-plant when in the larva state, for Frey gives it as feeding on *Erica*, adding, and other low plants; now I have frequently taken it where no *Erica* (this genus is rare in the Alps) was likely to be found for many miles.—R. C. R. JORDAN, 105, Harborne Road, Edgbaston: December 30th, 1888.

Tinea pallescentella in Birmingham.—Every year, in some manufactory here, or large warm building, I take two or three specimens of this insect; the last taken by me was on the 30th November, 1888. It appears in October and November, and this induces me to think that it is not indigenous, but an imported insect. The only time that I ever saw it plentiful was in a hair dresser's room, and perhaps this may give a clue to its food.—ID.

Phibalapteryx lapidata and *Oporabia filigrammaria* in Ireland.—When in the West of Ireland, in September, I took a specimen of *P. lapidata* on the hillside above Leenane. In the same district, and also in Achill, *O. filigrammaria* appeared to be common at elevations of over 1000 feet, at least, many specimens, many in good condition were found drowned in the small bog pools on the higher hill slopes. Either I was too late for them, or they sat very close during the day, for I only saw one very worn specimen alive. *Hydræcia nictitans*, the bright red form with white stigma, was not uncommon in the same district.—T. A. CHAPMAN, Firbank, Hereford: January, 1889.

Alucita hexadactyla, L., in Colorado.—Here is a tale which points a moral. When I came out to Colorado in 1887, I found very commonly about houses in Custer County an *Alucita* evidently allied to *hexadactyla*. Now I had frequently taken the genuine *hexadactyla* in Sussex, but was not so familiar with its characters to be sure whether my Colorado species was that or something allied. So during the past year I have been sending examples to various eminent authorities, and have received such reports as "apparently new," "near to *hexadactyla*," and so on. On the strength of these I gave it a MS. name, *A. montana*, and sent it out as such to a few correspondents, but refrained from publishing the name pending further investigations. At length, I sent one to Lord Walsingham (who should know, if anybody does), and now I hear from him that it is our old friend *hexadactyla* after all! *Hexadactyla* is already known from California and Oregon, but appears to be new for Colorado and the Atlantic slope. Lord Walsingham also identifies *Pseudocadia*

semilugens, Z., and *Laverna definitella*, Z., from Custer Co. specimens ; both of them new to my Colorado list.—T. D. A. COCKERELL, West Cliff, Custer Co., Colorado : December 28th, 1888.

Authentication of Hercostomus germanus as a British species.—Mr. G. H. Verrall, in his last year's "List of British Diptera," cites *Hercostomus germanus*, W., as one of the species reputed to be British and needing verification as such. It was plentiful last summer near Higher Shepton, in a road-cutting on the way to Bruton, facing Strutter's Hill, but is, apparently, a local fly in this neighbourhood.—A. E. EATON, Shepton Montague Vicarage, Castle Cary, Somersetshire: Jan. 7th, 1889.

Phanæus lugens.—An unfortunate misprint occurs in the description of *Phanæus lugens* in your last number of the Ent. Mo. Mag. On page 179, two lines from the bottom of the page, at the end of the line, the word "*arenatim*" has been printed for "*arcuatim*."—B. G. NEVINSON, 6, Tite Street, S.W.: January, 1889.

Sipalia testacea at Plymouth.—In the November number of this Magazine, Mr. Geo. C. Champion recorded the capture of *Sipalia testacea* at Sandown, Isle of Wight, and suggested that "it is doubtless to be found all along our southern coast, if looked for in its proper habitat." I have considered, therefore, that it will not be uninteresting to announce that I discovered three specimens of the insect at Plymouth in March of the same year, but was not aware of the fact until the Rev. Canon Fowler kindly named them for me, when sent to him some months afterwards. In November, I took four more examples ; I have not had time to search diligently, but inasmuch as these seven specimens are the result of several excursions in quest of them, I do not think that the species occurs plentifully here. Mr. Champion also refers to *Aëpus marinus* and *Robinii*, which, he says, he has not taken in company at Sandown. Both species are abundant in respective colonies at intervals along a beach in this neighbourhood ; but, contrary to that gentleman's experience, I have found them associated. The proportion of the one species to the other, however, has been so unequal that it is improbable that their mingling is other than accidental.

Altogether, I have registered in my note book 320 specimens of *Aëpus*, the aggregate of seventeen catches, but on five occasions only have I found the two species in association, and on these the species in minority have been represented by one or, at most, by two examples.—JAMES H. KEYS, 8, Princess Street, Plymouth : January, 1889.

Neuroptera, Trichoptera, and Orthoptera at Deal and neighbourhood.—During a three weeks' stay at Deal, from August 11th to September 1st last, beside *Lepidoptera*, I collected such species of *Neuroptera*, *Trichoptera*, and *Orthoptera* as came in my way. Like your correspondent, Mr. C. G. Hall (Ent. Mo. Mag., xxv, 163), I was much surprised at the few species of dragon-flies for so promising a locality.

NEUROPTERA: *Sympetrum striolatum*, abundant ; *S. flaveolum*, one specimen on the broad ditch near the far Battery on the Deal side of the sandhills ; *Æschna*

cyanea, one only in Folkestone Warren ; *Lestes sponsa*, very abundant on the broad ditch on the sandhills ; *Ischnura elegans*, abundant on the broad ditch ; a very small form also occurred not uncommonly ; *Micromus paganus*, Kingsdown ; *Chrysopa flava*, Folkestone Warren ; *C. flavifrons*, several ; *C. tenella*, when recently selecting a series of *C. vulgaris* for the cabinet, from a good number I set, I was pleased to find among them a specimen of this species ; *C. vulgaris*, apparently plentiful everywhere ; *C. septempunctata*, common, Deal and Kingsdown ; *Panorpa germanica*, common.

TRICHOPTERA : *Phryganea grandis*, Mr. J. W. Tutt gave me fine specimens of this, which he had taken on the sandhills ditch before my arrival, but it was evidently over, for I did not see it ; *P. varia*, common ; *Agrypnia Pagetana*, one specimen on Deal sandhills ; *Colpotaulius incisus*, common ; *Grammotaulius nitidus*, the most abundant species seen, taken very freely on the sandhills ditch by the aid of a lamp after dark, but not seen in the daytime ; *Glyptotælius pellucidus* ; *Limnophilus rhombicus*, not uncommon ; *L. flavicornis*, common, Deal and Folkestone ; *L. marmoratus*, plentiful, Deal and Folkestone ; *L. affinis*, several on rushes on the sandhills.

ORTHOPTERA : *Stenobothrus elegans*, plentiful ; *S. bicolor*, abundant ; *Gomphoceris maculatus*, common ; *Xiphidium dorsale*, on the sandhills ; *Phasgonura viridissima*, this fine species occurred in plenty ; it was most readily found by the aid of a lamp after dark, and a dozen adult specimens could easily be found in an evening on the tops of the rank herbage skirting the sandhills ditch, or in St. Margaret's Bay ; I also found it in the daytime in Folkestone Warren ; out of about thirty specimens examined, three or four (including both sexes) had bright yellow legs, all the rest having olive-coloured legs ; *Decticus griseus*, abundant.

The curious Hemipteron, *Chorosoma Schillingi* was common on the withered flower-heads of the marram grass ; and the big Dipteron, *Asilus crabroniformis* also occurred on the sandhills.—GEO. T. PORRITT, Huddersfield : January 10th, 1889.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.
December 27th, 1888.—T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Messrs. F. E. Fenton, M.R.C.P., F. P. Perks, J. Scudder, and W. Reid were elected Members.

Mr. F. E. Strong exhibited full-fed larvæ of *Bombyx quercus*, L., from Abergele, N. Wales. Mr. R. Adkin, a long series of *Fygæra anachoreta*, Fb., and remarked that in a recent number of "The Young Naturalist," Mr. Gregson, in an article on this species, suggested that the Continental specimens were readily distinguishable from the British by their ashy-grey shade ; the series now shown were all bred from one stock, and the colour varied from a brown tinge to the most ashy-grey tints, and he, therefore, thought that too much reliance should not be placed on the shade of colour." Mr. Billups read a paper, "A partial list of Parasitic Ichneumonidæ, with the hosts from which bred, during the last three years by a few members of the Society." Mr. Billups stated the list consisted of some hundred species, numbering some thousands of specimens, many of the species were exceedingly rare, and several new.

January 10th, 1889.—The President in the Chair.

Mr. R. Adkin exhibited *Noctua glareosa*, Esp., from Kent, Barnsley, York, Perth, Forbes, and Shetland. The Shetland specimens, and one of those from Perth, approaching a melanic form, the others being of the pale grey or slightly rosy type. Mr. J. A. Clark, dark varieties of *Cidaria suffumata*, Hb., from Forbes, black and a suffused form of *Melanthia bicolorata*, Hufn., from Forbes, and a variety of *Oporabia dilutata*, Bork. Mr. Tugwell, a series of *Boletobia fuliginaria*, L., with empty pupa case, and sketches of the larvæ. Mr. W. White, a coloured drawing of a variety of *Catocala nupta*, L., having the inferior-wings blue, the insect was taken at Colchester by Dr. Laver. Mr. E. Joy, bred specimens of *Pygæra pigra*, Hufn., from Wicken Fen. Mr. Chittenden, very black forms of *Acidalia inornata*, Haw., taken at Ashford, Kent. Mr. Jenner Weir exhibited, with other species, a female specimen of *Anosia Plexippus*, L., which he had received from Mr. Cockerell, Colorado, and stated that although in this specimen the inner edge of the wing was quite as black as those received by him from Canada and Hudson's Bay, it yet differed in the colour of the spots in the fore-wings being all white, whereas, in the northern specimens, the four large central spots were of a fulvous-brown, little inferior in richness to that of the disc; at the same time he showed the water-colour which Miss Crallan had made from the specimen taken at Lindfield, 1876, from which it appeared that the example then captured resembled the more northern form of the species. Male and female specimens of *Pieris oleracea* were also exhibited by Mr. Weir, who said he had always contended this species was not identical with *P. napi*, and he had received a communication from Mr. Scudder, who wrote that he had now been able to make the comparisons wished, and could report that the two species could be distinguishable from each other in the caterpillar and chrysalis stages, as surely and readily as *P. napi* and *P. rapæ* could be distinguished in the same stages. Mr. T. R. Billups exhibited eighty species of parasitic *Hymenoptera*, with cocoons from which many of them had emerged, and, in some cases, the larvæ from which reared.—H. W. BAKER, *Hon. Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON: *Fifty-Sixth Annual Meeting, January 16th, 1889*.—Dr. D. SHARP, F.L.S., President, in the Chair.

An Abstract of the Treasurer's Accounts, showing a balance in the Society's favour, was read by Mr. Osbert Salvin, F.R.S., one of the Auditors; and Mr. H. Goss read the Report of the Council. It was announced that the following gentlemen had been elected as Officers and Council for 1889:—*President*, the Right Hon. Lord Walsingham, M.A., F.R.S.; *Treasurer*, Mr. Edward Saunders, F.L.S.; *Secretaries*, Mr. Herbert Goss, F.L.S., and the Rev. Canon Fowler, M.A., F.L.S.; *Librarian*, Mr. Ferdinand Grut, F.L.S.; and as other Members of Council, Mr. Henry W. Bates, F.R.S., Mr. H. J. Elwes, F.L.S., Mr. William H. B. Fletcher, M.A., Mr. F. Du Cane Godman, M.A., F.R.S., Prof. Raphael Meldola, F.R.S., Mr. Philip Brooke Mason, F.L.S., Mr. Osbert Salvin, M.A., F.R.S., and Dr. David Sharp, F.L.S.

Dr. Sharp, the outgoing President, then delivered an Address, for which a vote of thanks to him was moved by Mr. Elwes, seconded by Mr. Salvin, and carried. A vote of thanks to the Treasurer, Secretaries, and Librarian was moved by Mr. J. W. Dunning, seconded by Lord Walsingham, and carried. Mr. Saunders, Mr. Goss, and Mr. Grut severally replied.—H. Goss, *Hon. Secretary*.

NOTES ON THE LARVÆ OF SOME *TORTRICES*, COMMONLY
BRED FROM THE GALLS OF *CYNIPS KOLLARI*, &c.

BY JOHN H. WOOD, M.B.

By collecting the galls of *Cynips Kollari* in the winter, various small moths, as is well known, may be bred from them in some numbers, chief among which are certain *Tortrices*. There is good reason to believe that most if not all of these insects enter the galls merely for the purpose of spinning up, and are not, in a true sense, inquilines, for not only do we find that it is the old dry galls that are productive, while the more recent ones are barren, but also that all attempts to discover the larvæ actually feeding in them fail—at least, such has been my own experience, and that of others, I believe, has not been dissimilar. That the galls do not furnish board as well as lodging is, at first sight, unexpected, because other kinds of oak-galls, as we shall see, are the common food of several of these insects. But the reason is not far to seek. In the woody rind of this gall lies an obstacle which the jaws of the young larvæ just out of the egg are unable to overcome, while at the same time its smooth and globular surface offers no facilities for concealment—a matter of almost as much importance to the generality of larvæ as food itself. If then the insects do not feed in the galls, where do they? A question I now propose to answer, so far as it concerns *Coccyx splendidulana*, *Coccyx argyrana*, *Heusimene fimbriana*, and *Ephippiphora gallicolana* (*obscurana*).

Coccyx splendidulana.—This is a common insect in the woods of Herefordshire, and its larva is to be found on the oak bushes, feeding between the leaves, from the end of June to the end of July. Even at this date, when the collecting of Micro-larvæ is not the most profitable of occupations, the oak keeps fairly rich in species; but to find them, we must pass by the rolled and folded leaves, and look instead for leaves spun flat together by their surfaces. In the spring, when these organs were tender and lent themselves readily to manipulation, the larvæ rolled and twisted them just as they pleased, but now that they have grown stiff and leathery, such treatment is no longer possible, and the larvæ have to content themselves with these simpler habitations, fashioned out of two adjacent leaves; while, for greater security, some of them, and *C. splendidulana* among the number, spin in addition a frass-lined gallery within, the equivalent, as it were, of the tubular chamber of the rolled leaf. It may be taken, I believe, as the rule, that larvæ that live in this way never eat through the whole thickness of the leaf, but leave the outer surface, whether of

the upper or under leaf, untouched, so as to preserve the wall of the chamber unbroken; the blotching which results from this habit is the best sign of their whereabouts.

The larva of *splendidulana* is cylindrical, moderately long, attenuated behind, and less so in front; with a clear, semi-transparent and rather shining skin of a whitish colour, obscured in places by the dark intestinal contents. Head, plates, and legs deep black; the spots also black and conspicuous. When full-fed it burrows into any old woody substance near at hand, and goes at once into pupa. The pupal chamber is cylindrical, and of nearly uniform width, but contracted somewhat at the mouth, which is closed by a firm lid scarcely to be distinguished from the surrounding surface; and is lined throughout with silk. In its excavation the woody tissue is swallowed as it is bitten off, and drops from the larva in well-formed pellets of frass—a very curious and not uncommon habit that prevails, I believe, among all Micros that form burrowing chambers, in which the diameter of the chamber, or, at least, of its mouth, is barely wider than that of the larva, and allows no room for the passage of the material by the side of the insect.

Coccyx argyrana and *Heusimene fimbriana*.—These larvæ are so much alike in habits and appearance, that it will be best to take them together. Both are inquilines of the fresh galls of *Andricus terminalis* (oak apple) and *A. ramuli* (woolly gall), from the end of June to the beginning of August. They do not merely graze the surface, or eat holes into the substance, but live in the very heart of the galls, out of sight and out of reach, which explains why it is, that, common as they are, or at least as is one of them, they so seldom fall to the beating stick. *Argyrana* refuses the oak leaves altogether, it will starve rather than touch them, and probably the same is true of *fimbriana*, but I have had too few of the latter to put them to the test. But *argyrana* is not exclusively a gall-feeder. The moth is as common here in the spring on the apple trunks as on those of oak, and it was from apple that my first specimens of the larva were obtained. In confinement, they readily eat and thrive upon the apple leaves, and can even be transferred to them from the oak galls, but their food on the tree is, I suspect, the unripe fruit, for the reason that it is nearly as difficult to beat them from this tree as from oak, which would scarcely be the case did they feed between the leaves; while all attempts to find them in such quarters by searching—and I have examined the leaves over and over again—have failed. Apple leaves, I may as well add, are a much better food to rear *argyrana* on—whether *fimbriana* also I cannot say—than the galls, for the latter, at this time of year, are green and sappy and most difficult to keep in a wholesome state.

Both larvæ have the soft, fat look so often seen in internal-feeders, and remind one especially of the fruit-eaters, *Carpocapsa pomonella* and *splendana*. They are,

sluggish, rather stout, and attenuated slightly behind, with well-marked divisions, and a distinct wrinkle across the back of each abdominal segment; semi-transparent, and of a pinky-white colour; with large and prominent red spots; brown shining heads; shining thoracic plates varying in tint from the body-colour to pale grey or greenish-grey, with a blackish border behind; and having the large spot, made up of the fused dorsal spots on the back of thirteen, dark grey or blackish, with a band of the same colour across the base of the anal flap. A pair of white belts cross the back of each segment, occupying the ridges on either side the transverse wrinkle: the anterior belt extends from the big spot in the spiracular region to the corresponding spot on the other side, and includes the anterior trapezoidals; the posterior is narrower and shorter, reaching no farther than the sub-dorsal region, and includes the posterior trapezoidals. On 3, 4, and 13, there is only one belt, the posterior being absent. It is in these belts that the chief distinction between the two larvæ is to be found. In *fimbriana* they are extremely well marked, their outline sharp, and their colour pure and almost enamel-like—the insect having, in consequence, a pretty, chequered appearance: in *argyrana*, on the other hand, they are much less distinct, both in colour and outline, and rather give the impression that the ordinary pink tint had faded from these parts, than that there had been any additional deposit of white. It was this character alone that prevented me, when I came across a larva of *fimbriana* for the first time on July 2nd, 1887, from passing it over as *argyrana*, with which I am already well acquainted. The spots in *fimbriana* are, perhaps, better described as chocolate than red, and it is also a rather larger insect.

Fimbriana makes up in the same way as *C. splendidulana*, and pupates at once, so that nothing further need be said about it. Its jaw-power, however, is remarkable—I once saw its empty pupa skin sticking out from the surface of a perfectly sound oak paling. *Argyrana*, on reaching full growth, gets under bark, or creeps into a crevice or into an old broken gall (*C. Kollari*), enlarging the cavity if need be, but never forming a burrowing chamber; and remains unchanged till the spring.

Ephippiphora gallicolana.—This also is an inquiline of the oak apple and woolly gall, occupying them in September and October, when the galls are ripe and dry. Like the two preceding species it gives no outward indications of its presence, and falls with a like difficulty to the beating stick, but by gathering the galls from trees scattered about in the fields and hedgerows, it may be obtained in abundance.

The larva has a general resemblance to its fellow inquilines, but is rather more slender, with the surface shining, the divisions less marked, the transverse wrinkle very shallow, and with no trace of the white belts. Up to the last moult the colour is pinky-white, often much obscured by the dark intestinal contents, after this date the pink tint disappears, and it becomes white or whitish. The spots are red and conspicuous, the large spot on the back of thirteen is grey, and a band of the same colour crosses the base of the anal flap. The head in the young larva is shining

brown, in the half-grown one black, and so remains without further change. Thoracic plate is at first shining brown, with a pale dividing line, it then passes through blackish-brown to its final condition in the full-grown larva, when it is yellowish, mottled with black, and with a black border behind. In spins up in the same places and after the same manner as *argyrana*, and does not pupate till the spring.

A large proportion of those reared indoors remain and make up in the oak apples, but they rarely do so in a wild state, for the gall tissue in wet weather sucks up moisture like a sponge, and would not afford the most comfortable of winter quarters: though, if the weather has been dry, they often do not leave immediately, but wait till rain comes and gives them notice to quit. In the autumn of 1887, when collecting larvæ of *Carpocapsa juliana* (also an occasional inquiline of these galls), I brought home, on one occasion, two larvæ of *gallicolana*, and, out of curiosity, transferred them to acorns; they took most kindly to the new food, and produced, this spring, the two largest moths I have ever reared. But in the wild state, I have never found them upon anything but the galls.

Tarrington, Ledbury :
December 31st, 1888.

LINEN INJURED BY *AGROTIS* LARVÆ.

BY C. G. BARRETT, F.E.S.

The linen manufacturing industry in the north of Ireland has again this winter been threatened with serious injury by the somewhat abnormally mischievous proceedings of certain larvæ, which have been found to gnaw holes in the linen during the process of bleaching.

Similar complaints were made in the same district a good many years ago, and to the best of my memory the mischief was then attributed to the larvæ of *Spilosoma fuliginosa* (Ruby tiger), which were found in suspicious proximity to the damaged material. The inference was, that finding themselves excluded from sunlight, they had gnawed their way through the linen to reach it.

Late in the past autumn I heard from the Rev. W. F. Johnson, of Armagh, that the mischief had re-commenced, and I advised him according to the previous supposition. He, however, placed me in communication with a gentleman largely engaged in the linen manufacture, L. M. Ewart, Esq., of Belfast, who set himself in a scientific manner to investigate the whole subject: tried experiments, forwarded to me from time to time specimens of the larvæ found upon the linen, and was good enough to follow closely such suggestions as presented themselves.

The larvæ sent were of three of our commonest species of *Noctua*, and of two species of sawflies—that of *Sp. fuliginosa* does not appear to have been noticed at all. The sawfly larvæ I am unable to determine, but as it was proved that they did no damage, but only crawled upon the linen, they may be dismissed from notice. The *Noctua* were *Triphæna pronuba*, *T. orbona*, and *Agrotis exclamationis*, all young, most of them from one-fourth to one-third grown, the last-named species being in the large majority.

The linen is laid out on the grass for, I believe, some days or weeks to bleach, and it has always been supposed that the damage was done while lying on the grass, and the only motive that could reasonably be suggested was that the larvæ were impatient of confinement, and gnawed their way through the linen at night for the sake of fresh air. This view proved to be a mistaken one, but I will quote Mr. Ewart's own words. On the 22nd ult., he wrote me as follows:—"We have found that the damage is not done on the grass, but after the cloth comes off the grass, when lying in heaps before being put into the next process, which is technically termed 'dip,' *i. e.*, a weak solution of chloride of lime. This was discovered thus: when a parcel of cloth was brought in from the field, it was at once examined, piece by piece, until stopping time came at six o'clock, and what had not been examined then lay over until the next day, when quite a number of pieces were found to be damaged, all that had been examined the previous day having been free. We have experimented with the different varieties of grubs by folding each in a small piece of linen, and putting some weight on the top of them, as there is considerable weight on the cloth when in heaps.

"The brown grub, of which I sent you specimens to-day, is the only one which cut holes, and it certainly did so, just the same as the original damages. Thus, it would appear likely that if the linen is put into the next process on the same day that it is lifted from the grass, there will be no damage, and this is quite practicable. If the cloth is lifted on a wet day, the custom is to keep it on the racks till it drains, but we should simply have to leave it out on the grass till it was sufficiently dry. Of course, in wet weather, this would involve the loss of a day or two, but that is a small premium to pay for immunity from damage.

"It is rather a strange thing that some of these grubs, after being all night in the dip, are alive next morning when brought out; and, in fact, on being subjected to a further immersion for another ten hours they are nothing the worse."

Mr. Ewart then proceeded to experiment as to whether any harm was done by the larvæ while in the "dip;" but this, as was expected, proved not to be the case. On the 3rd inst., he wrote: "Our experiment showed that they do no harm while in the 'dip.' *The injury is only done when the cloth is in the heaps*, so that we shall, I expect, be able to steer clear of it in future." And in his last letter he says: "It is a very great matter that the cause of the damage has been ascertained, and the means of avoiding it—which is, I believe, the case."

The larvæ which were found to gnaw the holes in the linen were those of *Agrotis exclamationis*, and to this species I think it probable that most of the damage may be attributed. They, as is well known, hide during the day in the earth, or at the roots of plants, crawling up at night to feed, but, probably, finding light and air excluded by the linen, they crawl upon the under-side of it for the day, instead of burrowing underground, and thus get gathered up with it. Then at night, being hungry, and finding themselves confined in the heap of linen, and under pressure, they act just as they would when underground, if necessary—use their strong jaws, and their hard heads, and dorsal plates to force their way through the opposing substance.

I think that Mr. Ewart, by the patience and acuteness with which he has tested their proceedings, step by step, has completely cleared up the difficulty, and found a preventive to the mischief. Even if the linen cannot be put into the "dip" directly it is raised from the grass, all injury can be prevented by the simple process of shaking every larva off it before laying it in the heaps or on the racks. But, probably, the workpeople could hardly be relied upon *always* to do this, and Mr. Ewart's plan is doubtless the best. At any rate, the discovery that the damage is *not* done while the linen is on the grass, *and so accessible to the larvæ*, sweeps away all the difficulty.

I am much gratified at the result of these experiments. Irish industries are not numerous, and the removal of a serious source of damage to one of the most important of them will, I hope, be of great advantage. Linen is *cut off* for sale wholesale in lengths of 60 yards, and holes through which a half-grown *Noctua* larva can crawl would very seriously affect their value, if not render them unsaleable.

It is curious to find that the *Agrotis* larvæ are not injured in any way by long immersion in a weak solution of chloride of lime! Had the immersion been simply in *water*, it would have been no more than ground-feeding larvæ must often expect at this season of the year.

King's Lynn, Norfolk :
December 10th, 1888.

NOTES ON SOME VERY OLD SPECIMENS OF *LEPIDOPTERA*.

BY C. G. BARRETT, F.E.S.

I have recently had the opportunity of examining some insects which, from their great age and their associations, seem to me to be of almost antiquarian, and quite *historic*, interest. They are in the collection of the Rev. Henry Burney, and were obtained many years ago by his father, in some cases through Mr. Charles Dale, from older collections. Mr. Burney, Sen., was contemporary with—and corresponded with—Haworth, Samouelle, Capt. Blomer, Leach, Curtis, Dr. Abbott, and other entomologists of a former generation, and many of their insects ultimately fell into his hands. Although he, unfortunately, did not label them very carefully, he preserved the specimens so well that they are but little faded, and still quite presentable, although from sixty to one hundred years old. Some of them seem to me deserving of a special notice.

One is a very beautiful *Plusia*, obtained sixty years ago from Mr. Charles Dale, who had it from the collection of Dr. Abbott, a rather noted collector at the end of the last century; it is, therefore, from ninety to one hundred years old, and is set in the rather drooping manner which seems to have been favoured by our early predecessors—with the costal margin of the fore-wings hardly so forward as the head. This specimen is *Plusia aurifera*, H.; it is figured very accurately by Noel Humphreys as a British species (Westw. and Humphreys' Brit. Moths, p. 233, plate 52, fig. 5) on the following grounds: "are supposed to have been taken near London, in Mr. Ingpen's collection," with the mention of "one in the British Museum taken near Dover by Rev. G. Lyon, considered as a singular variety of *Pl. chrysitis*." There is nothing to indicate whether the present specimen is the same as was formerly in Mr. Ingpen's collection, or another; its *name* even had not been preserved; its main interest lies in the fact that it is an ancient representative of a species formerly supposed to be British, and which may actually have been so, and have become extinct. Some colour is given to this supposition by the statement of Westwood that it was, at the date of his work (1840), "a native of Spain, Portugal, the South of France, and Teneriffe," while Staudinger now only gives as a locality the "Canaries," as though it were gradually retreating southwards.

Another of the specimens in question is a *Plusia illustris*, which also came from an old British collection, but without label or name. It is in fair preservation, but ill-set, obviously very old, and entirely

without a history. Haworth described this species as British, although he had himself seen none but German specimens; he says: "Mr. Donovan informs me that he took it in Wales." It was figured by Curtis, and also by Noel Humphreys; Professor Westwood stating (Brit. Moths, p. 281) that it "was formerly taken in some numbers on Salisbury Plain." For the same reason it was described by Mr. Stainton in the "Manual;" but it was placed by Mr. Doubleday in his last list among reputed British species. Probably Mr. Burney's is one of the original specimens, wherever they were obtained from: we have no recent record of its occurrence in this country, except a statement in "Entomologist" for February, 1889, that a specimen occurred in Ireland in 1887.

A third specimen cost me a great deal of research, and the only conclusion at which I could arrive was that it had been made to do duty as *Cloantha perspicillaris*, to which it bears a faint resemblance. But Mr. Burney found, lying loose in the drawer, an old label, "*subgothica*," and it proved that this specimen was really a type of the *Agrotis subgothica*, which was recorded as British by Stephens. An insect under this name was described by Haworth (p. 224), and figured by Humphreys (pl. 24, fig. 1), but Mr. Doubleday pointed out (Zool., 1847, p. 1720) that Haworth's insect was only a variety of *Agrotis tritici* (this is certainly the case in Humphreys' figure), and he goes on to say: "The species described and figured in (Stephens') 'Illustrations,' p. 126, pl. 22, fig. 3, is American. I have traced all the specimens which I have seen of this species in collections of British *Lepidoptera* to one source, and, I believe, the gentleman who distributed them inadvertently mixed a number of North American insects with his British ones. I received from him as British a *Bombyx*, which my brother took in Florida, and Mr. Benjamin Standish possesses two *Bombyces*, one a *Cerura*, the other, perhaps, a *Notodonta*, from the same entomologist, which were sent to him as British, whereas, both are well-known North American insects." *Agrotis subgothica* does not appear in the European lists, and, doubtless, Mr. Burney's specimen (which is not a var. of *tritici*) may be one of the North American specimens in question. It is in fair condition, but not set any better than the *Plusia*. The same may be said of a *Gonepteryx Cleopatra* and *Acontia solaris*, var. *lucida*, both very old, and having no indication about them of the continental method of "flat" setting. But they are without label or history, and their origin is "lost in the mists of antiquity."

But with these were some specimens the history of which is known, and the genuineness of which appears to be indisputable.

Heliothis scutosa.—One of the two specimens taken fifty years ago by Mr. Heysham, near Carlisle. It is a female in good condition, and darker in colour, and more strongly marked than those obtained in Norfolk some years ago by Mr. Thornthwaite. I think that no doubt need be entertained of the genuineness of this example of one of our rarest British species.

Certainly, the same may be said of another which Mr. Burney sent as “a funny little nondescript, which I have had for many years; I think it was from R. Weaver, and was taken by him in the fen country.” This specimen, which had never been recognised, is undoubtedly a female *Hydrilla palustris*. It is in good condition, and must have been taken in the fen country. The male is rare enough, but of the female I doubt whether half a dozen specimens exist in collections in this country; it is also very rare abroad. This queer little moth—not larger than a *Miana*—is, therefore, a great prize.

The most interesting other moths sent by Mr. Burney were two of the *original* specimens of *Epischnia (Anerastia) Farrella*, Curtis, taken by Mr. Farr near Yarmouth or Lowestoft. A very curious point about them is their large size, almost equal to *lotella*, and considerably greater than that of those recently taken in Norfolk, or those received from the continent.

King's Lynn, Norfolk :

February 5th, 1889.

THE NOISE OR SOUND PRODUCED BY BUTTERFLIES OF THE GENUS *VANESSA*.

BY H. T. STAINTON, F.R.S.

We read in No. 7 of “Insect Life” (Vol. i, p. 221) “*Vanessa Antiopa* has a ‘voice’ similar to *Acherontia Atropos*, but evidently not so strong, much finer, but still remarkably loud for its body, proboscis, and for a day butterfly. I heard it in Europe, in Lorraine, from two *Antiopas* on a beech stem, walking round each other, and agitating their wings with often-repeated cries, evidently preparing for copulation. I wrote of it to Dr. Eimer at Tübingen, but he wanted some larvæ of the *Antiopa* to study the thing, and I could not find him any, as they are scarce in Lorraine.—CH. WERCKLÉ, Ocean Springs, Miss. : September 6th, 1886.”

The first record of a sound produced by a *Vanessa* was in a note

by the Rev. Joseph Greene read at the February Meeting of the Entomological Society of London in 1853 (vol. ii, second series, Proceedings, p. 98).

On December 8th, 1852, Mr. Greene, who was engaged digging for pupæ, came to a moderate sized beech tree, of which the roots formed an arch about half a foot in height. As he was on the point of inserting his trowel into the cavity, a faint hissing noise was heard, and he started back, thinking it might be an adder. "Upon a closer inspection, however," he writes, "I discovered, to my great surprise, three hibernating *Vanessa Io*. Two were attached to the concave part of the arch, the third was on the ground, and the noise I heard proceeded from it.

"It is difficult to describe the noise exactly, but the nearest approximation to it, is the sound produced by blowing slowly, and with moderate force, through the closed teeth.

"It was decidedly not a rustling sound, such as would proceed from an imprisoned insect. While making the noise, the wings were slowly depressed and elevated. To remove any doubt as to whether the sound was produced by the insect, I pushed off one that was adhering to the tree, which immediately commenced the same movement of the wings, accompanied by a similar noise. That the noise was produced in part by the movements of the wings is very likely; but that it was only so, is, I think, improbable, from the fact of the extreme slowness (I might say, deliberation) with which the wings were opened and shut. Strange as it may appear, it certainly struck me that the noise was intended to intimidate! Whenever I pointed the trowel at it, it forthwith turned towards it, and commenced the noise with renewed vigour."

Three years afterwards, at the February Meeting of the Entomological Society in London in 1856, a note by Mr. W. C. Hewitson was read (vol. iv, second series, Proceedings, p. 2) on a sound produced by *Vanessa Io*.

"One morning, about a fortnight ago, whilst dressing, I noticed something upon the floor, which I took to be a dead leaf driven in by the wind, and was surprised, when I picked it up and placed it on the table, to find that it was a peacock butterfly (*Vanessa Io*). They had been cleaning out my room, and had driven it from its winter quarters. I had handled it rather roughly, which it resented by spreading out its wings horizontally to their full extent and rubbing them rapidly together; it produced a distinct sound like the friction of sand paper; this it continued to repeat for some time, and seemed greatly exasperated."

rated. It might be partly my own imagination, but its palpi, the position of its legs, every motion seemed to express passion.

"I brought it down stairs and placed it on a table in the drawing room, where Mr. Westwood (who was with me at the time) heard the noise faintly, but we tried in vain to excite it again to anger.

"I intended to examine the base of the wings, and try to ascertain the means by which it produced the noise, which has never yet been done with the living insect, but it stole away and hid itself so effectually as to elude our search."

Mr. Swinton, in his work on "Insect Variety; its propagation and distribution," quotes (p. 115) an observation by Mr. A. H. Jones on a hibernating female of *Vanessa Antiopa*, which, when disturbed, would partially expand her wings, and at the same time was produced a grating sound, which seem to come from the base of the wings." Mr. Swinton also mentions (p. 116) an observation he had once made in Scotland in August, on a female *Vanessa urticæ*, which had taken shelter for hibernation in an outhouse. He placed her, still drowsy, on the palm of his hand. "Then with the other hand," says he, "touching lightly the tails of the hind-wings, I induced her to depress and shut the wings successively. Each time she testily performed this action I heard distinctly, as the fore-wings were brought forward, when only the extreme basal portion of the wings was in contact, a sound like grating sandpaper."

It will be observed that in all these instances the sound was produced by a species of *Vanessa*. The observations of the English entomologists relate to *Vanessa Io*, *Antiopa*, and *urticæ*, when in hibernation, or laid up for that purpose. The American entomologist's note refers to *Vanessa Antiopa* when in a state of activity (the month is unfortunately not mentioned).

In each case some motion of the wings took place when the sound was produced, but this may have been only accidental correlation, because the insect was in a state of excitement at the time.

Mr. Hewitson alone speaks of the wings as being rubbed together. Whether the sound produced was in each instance the same is rather uncertain.

"A voice similar to that of *Acherontia Atropos*;" "a faint hissing as though caused by an adder;" "a distinct sound like the friction of sandpaper;" "a grating sound;" scarcely read like so many descriptions of the same thing.

HADENA ALBIFUSA, GROTE, IN GREAT BRITAIN.

BY JOHN B. SMITH.

In the January No. of the Magazine appeared an article on the above matter, which requires some additional information, and perhaps correction. The record of the capture of a foreign insect should never be made without the most careful investigation. In this case the circumstances of the capture of the insect are sufficiently certain, but with all due respect to the eminent entomologists who made the conclusions, they are not entirely warranted. In the first place, Mr. Grote never described any *Hadena albifusa*, though Mr. Walker did in the Cat. Brit. Mus., Noct., p. 753. This would have been unimportant, but in Bull. Buff. Soc. Nat. Sci., i, 104, Mr. Grote referred this species of Walker's to *Mamestra trifolii*, = *chenopodii*, a species common all over Europe, and I believe in England as well. In America the species is, as a rule, very uniform in colour, rarely becoming as brightly marked as in the specimen described by Mr. Barrett. It is rather variable otherwise, but within the same limits shown by the series of European specimens seen by me. Mr. Kirby is probably correct in the identification of the form as *albifusa*, but as *albifusa* is but a form of a common European species, and a form not geographical, the specimen collected by Major Partridge has its origin either on the continent, or what is more probable, it is a somewhat aberrant form, such as sometimes occurs everywhere, especially in species that are known to vary.

As an example of peculiar local occurrences, may serve a specimen received by me for determination some years ago. This was a perfect specimen, very familiar in appearance to me, but which I failed absolutely in identifying with any North American form. As a last resort, I looked over my European specimens, and at once recognised *Pseudophia illunaris*. There was not a particle of difference. I at once wrote to my correspondent at Chicago, and afterwards questioned him personally. He assured me that he had captured the specimen in his garden at sugar, and that it had all the appearance of a freshly hatched specimen. He never took another, nor have I ever heard of another having been taken.

This occurrence is the more remarkable, as Chicago is so far inland, and the place where the specimen was taken is not near the Lake shore.

Washington, D. C. : January, 1889.

ON A SPECIES OF *NOSODENDRON* FROM JAPAN.

BY G. LEWIS, F.L.S.

The genus *Dendrodipnis* was formed by Wollaston in 1873 (Ent. Mo. Mag., vol. x, p. 33), to receive an insect which is common in Japan in the exuding and rancid sap of a species of *Celtis*, which grows in the warmer parts of the Archipelago. Some fine trees of this *Celtis* grow on the outskirts of Nagasaki and at Shiba, near Tokio, and at either place *Dendrodipnis cænosus*, Woll., and its imago and larva may be taken abundant any day in June or July.

In *Dendrodipnis* the elytra are smooth, and in *Nosodendron* the wing-cases are ornamented with tufts of small spines, set in longitudinal rows, but I cannot see any valid reason for separating the species generically. Van de Poll has also expressed the same view in a recent letter to me. The *Byrrhidæ*, as a family, are very poorly represented in Japan, so far as my collection enables me to judge, for I only met with three examples of *Byrrhus* during the tour of 1880 and 1881, and the only abundant species in this section belong to the genera *Simplocaria* and *Limnichus*.

NOSODENDRON ASIATICUM, n. sp.

Ovatum, supra convexum, opacum nigrum; elytris punctis fasciculato-villosis, pilis brunneis; undique punctulatum. Long., $4 \times 4\frac{1}{2}$ lines.

Black, opaque, oval, convex above; forehead immarginate, rather convex between the eyes, somewhat densely punctulate; thorax with similar sculpture, with four patches of brown setose spines in the median area (visible only in fresh examples); scutellum triangular; elytra punctulate, with five rows of maculations covered with brown setæ, the first four rows consisting of 8 to 10 tufts, the outer row with about 6; the prosternal lobe is densely punctate; the mesosternum is deeply incised in three places for the reception of the base of the prosternum and the anterior coxæ.

This species is more perfectly oval than *fasciculare* of authors, the spinose maculations are similarly placed, but the spines are more dense and more rigid, the elytra are less shining, and the punctuation beneath is closer. The punctures on the metasternal plate are also smaller in *asiaticum*.

Hab.: Japan. Taken on Nantaizan, Ichibosayama, and other mountains.

1, Queen's Ride, Barnes:

January 24th, 1889.

DESCRIPTIONS OF NEW SPECIES OF *COREIDÆ*.

BY W. L. DISTANT, F.E.S.

Having recently worked out a collection belonging to this Family, which was forwarded to me from the Calcutta Museum for identification, it became necessary to describe the following species. Most of them had been represented by single specimens in my own collection for some years past, and the larger material belonging to the Calcutta Museum has now enabled me to describe these with greater certainty and completeness.

PRIONOLOMIA ABERRANS, n. sp.

♂. Dark brownish; antennæ (apical joint mutilated), membrane, anterior and intermediate femora, posterior femora and tibiæ, dark fuscous; anterior and intermediate tibiæ and tarsi and the posterior tarsi brownish-ochraceous; body beneath chocolate-brown. Antennæ with the basal joint longer than the second, which is also longer than the third; pronotum with the lateral margins finely and obtusely serrated, the lateral angles angularly produced and slightly directed upwardly, the base transversely channelled; scutellum very prominently and coarsely wrinkled at base; posterior femora robust, globose, and with a very strong and prominent spine before apex, and a small obtuse tooth and some very small spines at apex; posterior tibiæ flattened, finely serrated inwardly, and with a prominent tooth near base.

♀. Paler in hue, legs concolorous with body.

Long., ♂ and ♀, 37 mm. Exp. pronot. angl., 14 to 15 mm.

Hab.: Sikkim, Assam (Calc. Mus.; Coll. Dist.).

This species may at once be distinguished from the other species by the much less serrated margins of the pronotum, and by the smooth and moderately globose posterior femora of the male.

PRIONOLOMIA PALLESCENS, n. sp.

♂. Brownish-ochraceous, membrane fuscous; anterior and intermediate tibiæ all the tarsi, and a somewhat long spine on posterior femora, luteous. Antennæ, excepting basal joint, which is brownish-ochraceous, mutilated. Pronotum almost smooth, the lateral margins and angles strongly serrated, the last broadly and somewhat upwardly produced. Closely allied to *P. biplagiata*, Walk., but differing by the totally different coloration, the smooth surface of the pronotum, &c.

Long., 26 mm. Exp. pronot. angl., 11 mm.

Hab.: Assam (Coll. Dist.).

HOMŒOCERUS LACERTOSUS, n. sp.

Above, pale greenish or greenish-ochraceous; body beneath, antennæ, eyes, and legs ochraceous; lateral margins of the pronotum narrowly reddish-ochraceous; corium with a small, white, levigate, central spot, situate a little before the apical margin; abdomen above brownish-ochraceous. Antennæ moderately robust, basal

joint thickest, shorter than second, which is longest, third and fourth joints shortest, sub-equal in length; apical joint cylindrical, and moderately thickened. Pronotal angles well and sub-acutely developed.

Long., 21 mm. Exp. pronot. angl., $6\frac{1}{2}$ to 7 mm.

Hab.: North-Western Province, Shahabad (Calc. Mus.), Saharanpore (Coll. Dist.).

HOMŒOCERUS SIKKIMENSIS, n. sp.

Ochraceous, legs and antennæ somewhat darker; membrane bronzy; corium with a small obscure discal spot a little before the apical margin. Antennæ long; basal joint slightly thickened, almost as long as the second joint, third joint a little longer than fourth, which is cylindrical, moderately thickened and pale ochraceous, with the apical half fuscous. Body long, pronotum with the lateral angles only slightly and sub-acutely prominent; rostrum long, almost reaching the intermediate coxæ.

Long., 21 mm. Exp. pronot. angl., 6 mm.

Hab.: Sikkim (Calc. Mus.; Coll. Dist.).

LYBAS NODULOSUS, n. sp.

Body above, black, covered with short greyish pile, membrane dark black, body beneath and legs black; eyes, coxæ, and tarsi castaneous. Antennæ with the basal joint globosely incrassated, shorter than the second joint, which is also longer than the third, fourth joint shortest and luteous with the base black, the apex fuscous; head considerably prolonged between the antenniferous tubercles; pronotum with the basal lateral angles sub-nodulose; extreme apex of the scutellum obscurely ochraceous; rostrum castaneous, extending beyond the posterior coxæ.

Long., 8 to 10 mm.

Hab.: Sikkim (Calc. Mus.). E. Garo Hills, 1500 to 2500 ft. (Chennell; Coll. Dist.).

PENDULINUS ORIENTALIS, n. sp.

Body above, dull dark ochraceous, basal margin of head, lateral margins of pronotum, membrane and antennæ (apical joint of the last mutilated) black; body beneath pale ochraceous, sternal sutures and a sub-lateral stripe on each abdominal segment black; eyes, extreme base of antennæ, and legs, pale reddish, tibiæ more or less infuscated; abdomen above sanguineous. First and second joints of antennæ about sub-equal in length, third joint much shorter than second (fourth mutilated); head projecting very slightly in front of the antenniferous tubercles; pronotum thickly and coarsely punctate; the head, the anterior area, and lateral angles of the corium tinged with reddish; scutellum rugulose, and tinged with reddish, the margins and apex levigate and ochraceous; corium somewhat coarsely and thickly punctate, margins somewhat pale reddish; inner angle of membrane opaque; rostrum reddish, the extreme apex black, and about reaching the intermediate coxæ.

Long., 18 mm.

Hab.: Sikkim, Assam (Calc. Mus.); N. Khasia, 1500 to 3000 ft. (Chennell; Coll. Dist.); Tennaserim (Coll. Dist.).

NOTES ON SOME BRITISH AND EXOTIC COCCIDÆ (No. 13).

BY J. W. DOUGLAS, F.E.S.

ICERYA PURCHASI AND *ORTONIA NATALENSIS*.

Icerya Purchasi.—On the 27th of November Mr. G. Henderson received from Mr. J. R. Ward, Richmond, Natal (the same correspondent who previously sent *Ortonia natalensis*), several examples of another Coccid, some of which came on to me from Mr. R. T. Lewis; they proved to be adult females of *Icerya Purchasi*, with complete corrugated white ovisacs, agreeing with the figures and descriptions of Maskell and Riley, except that the ordinary brown shield on the anterior portion is hidden by a dense covering of white flocculent matter, amongst which are two or three projecting conical granulations, and thus exactly like the fig. 3, pl. i, of Riley's "Report for 1886."

In reply to my enquiry respecting this form, Prof. Riley says:—

"The female of *Icerya Purchasi*, on attaining full growth and commencing the secretion of the waxy egg-sac, is brown, as shown in fig. 5 of pl. ii of my Report for 1886. Certain of the females remain brown, as in fig. 4 of pl. i of the same Report, others become greenish-white through a waxy, pulverulent exudation. In my explanation to the plates I have designated them as 'the pale greenish-grey form' and 'the reddish-brown form.'"

With the insects Mr. Ward sent the following information:—

"These insects begin as white specks low down on young Australian wattles (*Acacia*), orange and lemon trees, &c; they get larger until some attain to half an inch in length. They have projections in front. The eggs are laid at intervals in the white receptacles."

Ortonia natalensis (cf. p. 86, *ante*).—On December 12th Mr. Lewis wrote respecting the living examples received in May:—

"In no single case of ten specimens was there any flocculent felted material found covering the body, as in *Icerya*, but the insects produced a quantity of white cottony matter composed of long threads curled and matted very loosely like cotton wool when pulled out thinly. I cleared it away from some and then observed its reproduction, though I was unable to determine how they produced it. At first a light woolly fringe appeared at the extremity of the abdomen, in a few days this increased, the insect stepping forward and leaving it as a train *behind*, until at the end of a month the length reached over an inch, numerous pink eggs being deposited therein. Four specimens alive but very sluggish on July 9th, I put aside on a sheet of paper covered in from dust, and they remained there until yesterday when I looked at them. All were dead and dry, each having a train of cottony stuff *behind* it. On putting them under the microscope I saw that most of the eggs were hatched or in the act of hatching; the empty egg-shells were mixed with the wool, and congregated together, chiefly on the body of the mother, were numerous larvæ alive. I send you herewith two of the specimens referred to, with their woolly trains nearly intact. If you turn them up you will find a number of living larvæ on the under-

side. The mother insects were alive at the beginning of August last; they have produced their trains of wool, laid eggs, died, and some of the eggs have been hatched some time since, but mostly quite recently; they have been kept in a room at ordinary atmospheric temperature until within the present week."

The larva of both species.—On December 19th Mr. Lewis wrote:—

"I enclose herewith outline drawings of recently hatched young of both species, *Ortonia natalensis* received in May, and *Icerya Purchasi* received in November. They are taken from fresh specimens killed and saturated without previous drying, so that their natural shapes and proportions are retained. I have examined many specimens, and though there are slight variations, the chief characters are so well marked in all, that it is impossible to confuse the one with the other. Both species

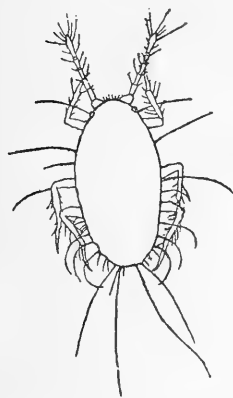


Fig. 2.

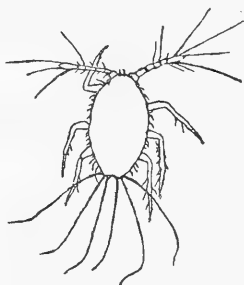


Fig. 1.

are drawn to the same scale, with the same objective and instrument. They are exactly alike in colour—bodies bright coral-red, legs and antennæ deep purple-brown. *Ortonia* is much larger than *Icerya*. Antennæ of both are closely similar as to number and shape of joints, but *Ortonia* has the terminal fringed with fine short hairs, whilst *Icerya* has four very long hairs. Eyes are simple and alike in form and position in both. Legs are very much alike in both, claws the same, with two small knobbed hairs. Hairs round the body distinctly different; *Icerya* having small hairs all round and six very long ones at the tail (Fig. 1), whereas *Ortonia* has one long hair near each eye, one between each pair of legs, three behind each hind-leg, and four very long ones at the tail, in addition to numerous short ones. (Fig. 2).

"On turning out the *Iceryæ* from the box I had great difficulty in finding any larvæ alive; at length I met with a living adult, the only one yet seen, and under this were a number of live ones."

The larvæ of *Icerya* agree exactly with the descriptions of Maskell and Riley. The characters afforded by the larva of the *Ortonia* are not only interesting in themselves, but, considered in conjunction with those of the adult female (pp. 86, 87, *ante*), are efficiently indicative of the distinct specific value of the form, and (as genera are now estimated) of its generic value separate from *Icerya*. It does not at all agree with Signoret's description of *I. sacchari*, which feeds on sugar canes in Mauritius. Whether or not it will prove to be a true *Ortonia* remains to be seen, when we know its male and the male and larva of *Ortonia*.

The camera lucida drawings of the larvæ by Mr. Lewis ($\times 40$) are here reproduced one-half the size.

Predaceous enemies of the Icerya.—Mr. Lewis also wrote:—

"Amongst the *débris* in the box were a few eggs; but there were innumerable detached legs and skins of young ones for which I could not account, until the discovery of a 'ladybird' explained the probable cause. This assumed destroyer has red elytra without black spots, and is red beneath. It is not a recognised species at the British Museum."

Mr. C. O. Waterhouse thinks that it is probably a variety of *Rodolia iceryæ*, Janson (*cf. infra*), and not mature. As there is but one example in this country, this is a difficult matter to determine, and we must wait for more specimens, which I hope to obtain.

In this connection it may be noted that in his "Report" for 1886, p. 484, Prof. Riley mentions that in California

"The ambiguous ladybird (*Hippodamia ambigua*, Leconte), has been observed feeding upon the eggs of *Icerya* when they were exposed to view by the egg-sac being broken open; but neither this nor any other species of ladybird was seen to feed on the adult insect, although commonly attracted by the honey-dew secreted."

At p. 487 he states that Miss Ormerod has received from Port Elizabeth, Cape Colony, specimens of an undescribed species of *Coccinellidæ*, "which has been exceedingly serviceable in destroying the Australian Bug, as they call it;" and Miss Ormerod "proposes to notice it, with full technical description and a figure, as *Rodolia iceryæ*."

Miss Ormerod has had the kindness to send me a pamphlet of 36 pages compiled by her, and published* primarily for distribution in the districts of South Africa infested with the *Icerya*, with a view to measures of prevention of its ravages. In this appears a description of the beetle by Mr. O. E. Janson, under the name of *Rodolia iceryæ*, *n. sp.*

By a communication from Mr. S. D. Bairstow, President of the Eastern Province Naturalists' Society, South Africa, dated from Port Elizabeth, the services of the larvæ of the *Rodolia* in the destruction of the *Icerya* appears to be very efficient; the mode of their operation is thus stated:—

"The *Coccinella* is by far our best friend. It is proving a perfect god-send in destroying the perfected young in the nidus of the female 'bug.' The larva buries itself in the gravid female, and completely destroys her progeny, the dead carcase falling to the ground; and it eats the 'bug' not only when it is young, but when it (the *Coccinella*) has developed to beetle condition. I have taken as many as five or

* Notes on the "Australian Bug" (*Icerya Purchasi*) in South Africa. By Eleanor A. Ormerod. London: Simpkin, Marshall & Co., 1887. See also Miss Ormerod's "Report on Injurious Insects," 1887, p. 30.

six young bugs out of the inside of one of these *Coccinellæ*. Its efficacy cannot be over estimated, and an importation of the *Coccinellæ* to infested regions would be certain to be of service."

The increase of *Icerya Purchasi* in South Africa is also materially checked by the larvæ of a species of *Chrysopa*, described and figured as a new species under the name of *Ch. iceryæ*, which preys upon the eggs while still in the ovisac of the female.

Mr. Frazer S. Crawford, of Adelaide, South Australia, also writes to Miss Ormerod :—

"For the last three years I have had a colony of *I. Purchasi* in a lemon tree in my garden ; the other day, being desirous of obtaining some living specimens, I found that every one had been destroyed, not a single one could I find after a prolonged search. This has been the work of two parasites. First the larva of one of our native *Coccinellidæ* ; but the principal exterminator has been a *Dipterous* insect in the shape of a minute metallic greenish-black fly."

Neither the *Coccinella* nor the *Dipteron* has been determined.

8, Beaufort Gardens, Lewisham :

January, 1889.

Two species of Trichoptera new to the British List.—When examining the mass of material which I have brought together with the view of working out a contribution to a Neuropterous Fauna of Ireland, I find the following species, which are new to the *Trichoptera* of Britain :—

Lyte fragilis, Pict.—Very common at Laogh Corrib, near Galway, Yewpoint, and Summerhill, on the Connaught side ; Coosam Point, Shannon side, and Hare Island, Laogh Ree, near Athlone.

Agapetus delicatulus, McLach.—A few specimens of this species were taken at Tore Cascade, Denough river, and in the Horses' Glen, Mangerton, all near Killarney.—JAMES J. F. X. KING, 207, Sauchiehall Street, Glasgow : February, 1889.

Holocentropus stagnalis, Albarda, in Ireland.—Although it is unsafe as a rule to record a species of *Trichoptera* from a female, yet I believe I am correct in recording *Holocentropus stagnalis* from Doogan Laogh, near Westport.—ID.

Note on Stenophylax stellatus and S. latipennis.—During the season of 1888 I captured at two small streams near this place considerable series of the above-named insects. In both localities the species were intermingled, and were represented by the two sexes.

In attempting determination I have encountered an old difficulty. The differences in the anal parts of the males of the two species are slight, but they are good and constant ; the corresponding parts of the females, however, present no appreciable characters. After many examinations I have succeeded in "placing" all my specimens to my own satisfaction, on the strength of a rather obscure neural character combined with slightly different facies.

The character alluded to has reference to the point of origin of the lower branch

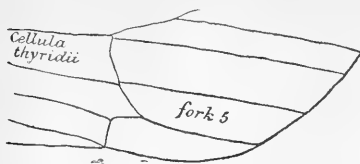


Fig. 1. *S. stellatus*.

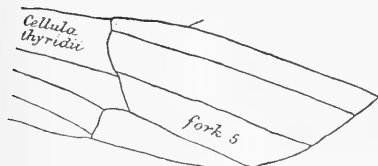


Fig. 2. *S. latipennis*.

of the upper section of the superior cubitus. In *S. stellatus* this nervure arises either from the same point as the transverse nervule closing the cellula thyridii, or from the transverse nervule itself immediately below its beginning. In *S. latipennis*, on the other hand, the same nervure arises considerably below the beginning of the transverse nervule.

My friend Mr. King has kindly examined his materials in these species, and finds the character in the main to hold good. It rests with other entomologists to decide whether it is of local or general importance. The point is confessedly slight, hardly to be called a character;

yet, should its general occurrence be proved, it may be used with caution as an aid to identification.

I may add that all the ♀ of *S. latipennis* possessed by me are comparatively small; and further, that I have never taken this species at any of our larger streams. —KENNETH J. MORTON, Carlisle, N. B.: January 24th, 1889.

[The character alluded to by Mr. Morton may be put in other words. In *S. stellatus* he means to say that apical sector No. 7 arises directly (or nearly so) from the commencement of the transverse nervule closing the cellula thyridii, so that apical cellule No. 6 is acute (or nearly so) at the base. In *S. latipennis* sector No. 7 arises somewhat below the commencement of the transverse nervule, closing the cellula thyridii, so that cellule No. 6 is distinctly truncate at its base. The best character whereby to separate the two lies in the form of the superior appendages of the ♂; but, unfortunately, these are very frequently retracted in drying, and no longer visible.

I have compared Mr. Morton's character with my own materials. Of 21 examples of both species in my British collection, the result is that they remain as originally placed, only one specimen remaining slightly doubtful. Upon turning to my general European collection, I find 35 examples from very varied localities. The small neural character holds good as a rule, but there are certain examples (placed as *latipennis*), chiefly from Austria and Switzerland, in which it seems to fail. A slight suspicion has long existed that there may be a *third* species, and on my re-examination I was struck by certain characters (perhaps illusory) in the superior appendages of the individuals placed as *latipennis* (alluded to above) which merit investigation from fresh specimens. Mr. Morton's neural character is useful, but it is so slight that it would be *contra leges Naturæ* to expect it to be practically constant.—R. McLACHLAN].

Aquatic habits of Salda.—While collecting *Salda* in September last on the mud-flats of Lelant Harbour, West Cornwall, I was curious to know how they

behaved when overtaken by the tide. It was clear that if they then left the flats they went further than the margin of the harbour, for at high water very few were there to be seen, while at low tide the mud where *Salicornia* and other salt-plants grew was amply stocked. The first noticeable thing was that *S. saltatoria* did not affect the flats far from the margin. *S. lateralis*, however, was plentiful where spring-tides covered the mud for more than two hours at a time. As the result of many observations, it appears that on feeling the flowing water, the *Salda* appresses its femora to the body, and fixes itself along a stem or a blade of grass, which it firmly holds to. In cases where the place was for some reason left for another, I noticed the insect slowly crawl on the mud, under the water, to a fresh plant; now and again it happened that the water suddenly coming in, took the *Salda* unawares, and bore it up on the surface: but it kept there no longer than until it got hold of a stem or a blade, down which it slowly crawled, till near the mud, and there remained. I watched one until the receding tide left it after near an hour's submersion: so long as its body and surroundings were wet, it showed nothing of its usual wariness and activity, and was easily taken up with the fingers; it proved to be *S. saltatoria*.—JAS. EARDLEY MASON, Alford, Lincolnshire: Jan. 26th, 1889.

Hemiptera-Heteroptera in West Cornwall.—While on vacation in West Cornwall in September last, I met with the following, all near St. Ives and Hayle:—*Rhacognathus punctatus*, L., out of a tuft of furze and heather; *Piezodorus lituratus*, Fab.; *Scolopostethus ericetorum*, Leth. ?; *Calyptonotus lynceus*, Fab., several on Lelant Tonaus (sand-dunes), at roots of grasses; *Macrodera microptera*, Curt.; *Drymus brunneus*, Sahlb.; *Rhyparochromus chiragra*, Fab., *R. prætextatus*, H.-Schäff.; *Peritrechus luniger*, Schill.; *Plinthisus brevipennis*, Latr.; *Stygnocoris arenarius*, Hahn, *S. sabulosus*, Schill.; *Monanthia cardui*, L. I beat many hundreds of thistles, but got not a single individual; all I took were from a hedge of mixed vegetation. *Derephysia foliacea*, Fall.; *Miris lævigatus*, L., *M. calcareatus*, Fall., *M. holsatus*, Fab.; *Megalocera ruficornis*, Fall.; *Phytocoris tiliæ*, Fab., *P. longipennis*, Flor., *P. varipes*, Boh., the last off thistles; *Oncognathus binotatus*, Fab.; *Calocoris bipunctatus*, Fab.; *Liocoris tripustulatus*, Fab.; *Lygus pabulinus*, L., *L. contaminatus*, Fall., *L. cervinus*, H.-Schäff.; *Monalocoris filicis*, L.; *Pithanus Märkelli*, H.-Schäff.; *Chlamydatum ambulans*, Fall.; *Orthotylus Scotti*, Reut.; *Asciodema obsoleta*, D. & S.; *Heterotoma merioptera*, Scop.; *Plagiognathus arbutorum*, Fab.; *Anthocoris nemorum*, L.; *Nabis lativentris*, Boh., *N. major*, Costa, *N. ferus*, L., *N. rugosus*, L.; *Salda lateralis*, Fall., *S. pallipes*, Fab., *S. saltatoria*, L.; *Gerris thoracica*, Schum.

In October, 1886, in the same localities I obtained, besides some of those noted above: *Picromerus bidens*, L.; *Stenocephalus agilis*, Scop.; *Dieuches luscus*, Fab.; *Charagochilus Gyllenhalii*, Fall.; *Megalocera erratica*, L.; *Orthotylus ericetorum*, Fall.; *Nabis ericetorum*, Scholtz.

The paucity of individuals, especially on the heather and furze of the hills, was in marked contrast to the abundance of insects there in 1886.

Thinking that the Scilly Isles might be worth sampling, I spent two days there. Any ideas I might have had as to possible abundance of something were soon dis-

pelled. Real hard work produced me nothing but *Pentatoma verbasci*, De Geer, many on tree-mallow; *Piezodorus lituratus*, Fab.; *Peritrechus luniger*, Schill.; *Nysius thymi*, Wolff; *Phygadicus urticae*, Fab.; *Plinthisus brevipennis*, Latr.; *Stygnocoris arenarius*, Hahn, and *sabulosus*, Schill.; *Piesma quadrata*, Fieb.; *Lygus pratensis*, Fab., *L. Kalmii*, L.; *Eroticoris rufescens*, Burm.; on the most exposed part of St. Martin's, where nothing grows but the dwarfed heather prostrate to the ground, and scathed by the fierce west winds; *Orthotylus Scotti*, Reut.; *Nabis ferus*, L., *N. rugosus*, L.; *Notonecta glauca*, Fab.; *Corixa Geoffroyi*, Leach, *C. affinis*, Leach, *C. hieroglyphica*, Dup.—ID.: February 8th, 1889.

Note on Oinophila Vau-flava.—Some recent observations on the life-habits of this insect have led me to understand why Snellen should have removed it to the vicinity of the true *Tinea*. (See De Vlinders van Nederland, Micro.-Lepid., 474, and Tijdschrift voor Entomologie, xix, 51.)

I had collected five of the larvæ, which are well characterized by their form, so extraordinarily elongate and narrow, reminding one indeed of larvæ of *Ochsenheimeria*. The individual joints are so prolonged that the distances between the pairs of legs appear much greater than in other larvæ. The ground-colour is bone-white, with the head and thoracic shield brown.

It makes long silken galleries on the fungus-covered walls of old wine-cellars, feeding on these fungoid growths. It would appear that it sometimes, like a true *Tinea*, lives in a case, since our esteemed colleague, Frau Diederichs, has bred it from such a case.

I doubt not that this is capable of a third habit, that of burrowing in corks, but I do not believe it has any exclusive weakness for the corks of the bottles, which contain Madeira or Sherry. It, no doubt, says, like other *Tinea* larvæ: *Serviendum est temporis*.—E. HERING, Berlin, N.W., Invalidenstrasse, No. 43: November, 1888.

Bactra furfurana in West Norfolk.—This somewhat local insect I found last summer in the bottom of an old dried-up pit (small pond) near Wisbech. It was flying about in the sunshine in plenty. I had not seen it previously, although it is a spot I am frequently in the habit of visiting.—A. BALDING, Wisbech: February, 1889.

Callicera ænea, Fab.—Mr. Verrall's notice of this very rare and beautiful member of the *Syrphidæ*, induces me to send some further particulars. The specimen sent to Dr. Capron was, I am informed, taken by Mr. Albert Piffard near Great Berkamstead, Hertfordshire, August 6th; Mr. Marshall's specimen at Cornworthy, near Totnes, July 26th; while mine was captured at Guestling, near Hastings, August 22nd. All were taken on the flowers of *Umbelliferae*; in two cases, at least, on *Angelica sylvestris*, the flowers of which are most attractive to *Diptera* and other insects. This insect is remarkable among the *Syrphidæ* for its long tapering conops-like antennæ. A good figure is given of it in Walker's *Diptera*.

Is anything known of its life-history, or of the kind of localities in which it occurs on the continent?—E. N. BLOOMFIELD, Guestling: February, 1889.

Leistotrophus nebulosus in Ireland.—Among some *Coleoptera* sent to me for identification by the Rev. S. A. Brenan, of Cushendun, County Antrim, was a specimen of *Leistotrophus nebulosus*, which does not appear to have been recorded from Ireland previously.—W. F. JOHNSON, Armagh: February, 1889.

Melœ rugosus, Marsh., at Broadstairs.—On the 1st of December last, I picked up a specimen of this insect on a pathway in Broadstairs—a curious date, and a somewhat strange locality. Among a few *Coleoptera* taken near Berkeley, Gloucestershire, last May, I find a specimen of *Liosomus oblongulus*.—THEODORE WOOD: February 4th, 1889.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.
January 24th, 1889.—T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Rev. Joseph Greene, M.A., F.E.S., was elected a Member.

Mr. W. H. Tugwell exhibited a fine bred series of *Deilephila galii*, Schiff. Mr. J. A. Clark, *Acidalia immorata*. Mr. Adye, forms of *Argynnis Paphia*, L., var. *Valesina*, Esp. Mr. Tutt, on behalf of the Rev. C. A. Sladen, a black and almost spotless variety of *Strenia clathrata*, L., and a melanic specimen of *Agrotis simulans*, Hufn, from the Hebrides.

The Treasurer then read an Abstract of his Accounts for 1888, showing a balance of £24 15s. in favour of the Society. The Report of the Council was read by the Secretary, and the following were elected as Officers for 1889:—Mr. T. R. Billups, F.E.S., President, Mr. J. T. Carrington, F.L.S., and Mr. W. H. Tugwell, Vice-Presidents, Mr. E. Step, Treasurer, Mr. W. West (Greenich), Curator, Mr. D. J. Rice, Librarian, Mr. H. W. Barker, F.E.S., Secretary, Mr. H. J. Turner, Assistant Secretary, Messrs. R. Adkin, F.E.S., C. A. Briggs, F.E.S., T. W. Hall, F.E.S., J. Henderson, W. Manger, J. R. Wellman, and J. J. Weir, F.L.S., Council.

February 14th, 1889.—The President in the Chair.

Mr. A. C. Vine was elected a Member.

Mr. R. Adkin exhibited examples of *Acertia Caia*, L., from Morayshire and Kent, and *Hydræcia nictitans*, Bork, from Morayshire. Mr. Tugwell, a marked variety of *Chærocampa porcellus*, L., also a variety of *Deilephila galii*, Schiff, bred from larvæ taken at Deal; he remarked that he had bred two of this variety, and to the present time, seventy of the normal form. Mr. Turner, light forms of *Zygæna filipendulæ*, L., from Reigate.

Mr. Weir exhibited three male and three female specimens of a butterfly he had received from the Falkland Islands. They were of the same genus as our well-known *Brenthis Selene* and *B. Euphrosyne*, and were apparently closely allied to the Chilian *Brenthis Anna*, Blanch. Mr. Weir stated he had not yet been able to make the necessary references, but he was at present disposed to regard them as a species new to science, and if, upon future examination, he found his view correct, he proposed for them the name of *Brenthis falklandica*. It was interesting that Palearctic and Nearctic genera of *Lepidoptera* re-appeared in the southern part of

South America, which were quite unknown over a vast extent of the intermediate latitudes, but it should be borne in mind that there was in the American continents an almost continuous chain of mountains from the Arctic Ocean to the Straits of Magellan, which might have formed a connected temperate region, by which the migration of species from the North to the South was effected, at a time when the temperature of the earth was different to that which now obtains.

Mr. Carrington, parasites from larva of *Acronycta alni*, L. Mr. Tugwell, on behalf of Mr. Porritt, two very dark specimens of *Boarmia repandata*, L.

Observations were made upon a reported case of stridulation by a species of *Vanessa*, and a discussion ensued.—H. W. BARKER, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON: *February 6th*, 1889.—The Right Hon. Lord WALSINGHAM, M.A., F.R.S., President, in the Chair.

The President announced that he had nominated Mr. H. J. Elwes, F.L.S., Mr. F. Du Cane Godman, F.R.S., and Dr. Sharp, F.L.S., Vice-Presidents for the session 1889—90.

The Rev. F. D. Morrice, M.A., of Rugby; Mr. A. Robinson, B.A., of Brettanby Manor, near Darlington; and Mr. H. Burns, of Fulham, S.W., were elected Fellows.

Lord Walsingham exhibited a larva of *Lophostethus Dumolini*, Guer., sent to him by Mr. Gilbert Carter, from Bathurst, West Coast of Africa.

Mr. G. T. Porritt, exhibited several melanic specimens of *Boarmia repandata* from Huddersfield, and, for comparison, two specimens from the Hebrides. Mr. McLachlan remarked that melanism appeared to be more prevalent in Yorkshire and the north midlands than in the more northern latitudes of the United Kingdom.

Mr. Elwes read a paper "On the genus *Erebia*, and its geographical distribution." The author, after referring to the number of species and named varieties, many of which appeared to be inconstant as local forms, made some remarks on the nomenclature of the genus, and suggested that a better system of classification might be arrived at by anatomical investigation. It was stated that little was known of the early stages and life-history of species of this genus, the geographical distribution of which was Alpine rather than Arctic. The author remarked that it was curious that there was no species peculiar to the Caucasus, and that no species occurred in the Himalayas, where the genus is replaced by *Callerebia*; that none were found in the Himalo-Chinese Subregion, and none in the Eastern United States of America. He also called attention to the similarity of the species in Colorado and North-West America to the European species. Lord Walsingham, Mr. Waterhouse, Mr. O. Janson, Mr. McLachlan, Dr. Sharp, and Mr. Jenner Weir took part in the discussion which ensued.

Mr. W. Warren read a paper "On the *Pyralidina* collected in 1874 and 1875 by Dr. J. W. H. Trail in the Basin of the Amazons."

Mr. C. J. Gahan read a paper entitled "Descriptions of new or little-known species of *Glenea* in the Collection of the British Museum."

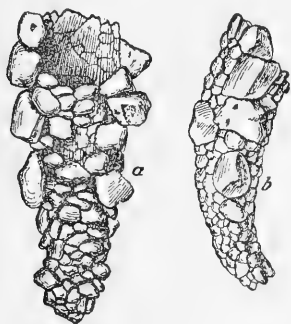
Mr. J. S. Baly communicated a paper entitled "Notes on *Aulacophora* and allied genera."—H. Goss, *Hon. Secretary*.

THE METAMORPHOSES OF *APATANIA MULIEBRIS*, McLACH.:
A CHAPTER IN PARTHENOGENESIS.

BY PROF. FR. Klapálek.

In the second half of October, 1886, when seeking the preparatory stages of *Silo nigricornis*, Pict., I found at a little spring with clear and very cold water in the neighbourhood of Leitomischel in Eastern Bohemia, numerous cases enclosing larvæ and pupæ, which I had never seen before. I tried to rear the insect, but in vain. The following year I found them at the same locality, and at the same time, but in small number. It was only last year that

I succeeded in rearing many of them, and caught perfect insects sitting on the plants on the margins of the spring. Upon examining the pupæ in the winter of 1886—7, I felt sure they could only be those of an *Apatania*, and the bred insects confirmed this idea. I determined them as *A. muliebris*, and Mr. McLachlan is of the same opinion.



a. Larval case of *Apatania muliebris*,
beneath ;

b. the same from side : $\times 5$.

The general appearance of the larvæ is quite similar to that usual among the *Limnophilidæ*. They are rather stout, cylindrical, 7 mm. long and 1·8 mm. broad. The head is broad-oval, nearly spherical, brown with two darker spots on either side above the eyes, and with many less dark dots on the crown and on the hind part of the temples behind the eyes. The mouth parts are as in other *Limnophilidæ*. Pronotum almost quadrate, slightly narrowed posteriorly, brown, excepting the anterior margin, and two large spots on the posterior margin where it is paler ; the posterior margin is broadly shining black. Mesonotum quadrangular, more than twice as broad as long, brown with some darker dots. Legs brown, gradually increasing in length, with strong claws. The lori (humps) on the first abdominal segment rather large. Lateral line conspicuous, with grey hairs on segments 2—7. Respiratory filaments on segments 2—6. The anal processes very short, two-jointed, with a strong, much-curved, claw.

The pupæ are 6 mm. long by 1·8 mm. broad. Antennæ as long as the body. The mouth parts are on the whole the same as in other *Limnophilidæ*. Spurs 1, 2, 4. The anterior and posterior tarsi hairless, the intermediate longly ciliate. The dorsal part of the posterior margin of the first abdominal segment is provided with two warts

with numerous points. On segments 3—5, anteriorly on either side, are two, on 6—7 three, little hooks; on the posterior margin of segment 5 are six or seven such hooks. The dorsal respiratory filaments are on segments 2—4, the ventral on segments 2—6; lateral line conspicuous from segments 6—8, and with long grey hairs. Anal processes long, slender, stout at the base, curved outward at the apex.

The case (see figures) is a conical sand-tube, strongly attenuate posteriorly and much curved. The head end is somewhat produced above, so as to protect the head of the larva; the anterior opening is therefore very oblique. The surface of the case is very rough, and larger sand grains are arranged on the sides. The cases of the pupæ have the anterior end closed with very fine sand grains, and are mostly attached to the under-side of large stones, often mixed gregariously with those of *Silo nigricornis*. They adhere closely to the stones.

There is another matter of importance concerning the preparatory conditions of *Apatania muliebris*. It is stated in Mr. McLachlan's "Revision," p. 216, and (Suppl.) p. xlvii, that there is strong evidence to induce us to believe that this species propagates parthenogenetically. In order to prove this incontestably we must breed the insects from eggs laid parthenogenetically. There is, however, stronger evidence. Mr. McLachlan could never find a ♂ of this species. And still stronger is the fact that we find no ♂ pupæ. During the several years that I have had this insect under observation, I have never seen a ♂ pupa amongst the large number examined. The spring where the species occurs is very small, and I know all the *Trichoptera* inhabiting it. The others are *Drusus trifidus*, McL., *Halesus auricollis*, P. (unusually small), *Silo nigricornis*, P., *Crunæcia irrorata*, Curt., *Beræa pullata*, Curt., and *Plectrocnemia conspersa*, Curt.; mostly very abundant.

Kl. Weinberge, 24, Puchmajer-gasse, Prague :
March 1st, 1889.

[This is a valuable communication from several points of view. It practically establishes as a fact that *Apatania muliebris* propagates parthenogenetically (and *A. arctica* of Spitzbergen, and Nowaja Zemlja, &c., is about in a parallel condition), yet one hopes, in such cases, that a male may occasionally exist. It also proves that there is no great dissimilarity of habits between *Apatania* and allies and the rest of the *Limnophilidæ*. Nevertheless, there is a good deal of discrepancy in the structure of the perfect insects, and Wallengren recently formed a distinct Family for their reception (*Apataniidæ*). — R. McLACHLAN].

NOTES ON *TORTRIX DECRETANA*, TR., WITH A DESCRIPTION OF ITS LARVA.

BY EDWARD A. ATMORE, F.E.S.

During a short visit to King's Lynn in October, 1887, Mr. W. Warren detected a pair of this fine *Tortrix* amongst my captures for that year, and subsequently the species was added to our Fauna (*vide* Ent. Mo. Mag., xxiv, p. 125). A third specimen (a ♂) found among my series of *T. Podana* must have been taken at least some three or four years previously, and I have also since observed three females among the series of *Podana* which were placed in the Lynn Museum early in 1884. But my first acquaintance with the species appears to have been made as far back as 1881, in which year I collected larvæ of several species of *Tortrices* feeding on *Myrica gale* (bog myrtle), in order to separate and describe the larva of *T. Lafauriana*. I have a distinct recollection of breeding at that time some specimens of *T. decretana*, which, however, were passed over as merely pale forms of *Podana*, and therefore received their liberty. This circumstance of my having remembered breeding the insect in 1881 has served at least one useful purpose, namely, that of furnishing a clue to the locality which might in future be searched with a fair prospect of success, for *T. decretana* seems to be very local. Accordingly, at the beginning of July last year, I repaired to this locality and collected a large number of larvæ of several species of *Tortrices* feeding in various ways between leaves and shoots of *Myrica gale*.

After having carefully separated the apparently different larvæ, and kept them well supplied with food until they "struck work" to undergo pupation, I anxiously awaited the result. My anticipations were amply verified, for on July 29th, the first specimen of *T. decretana* (a beautiful ♂) emerged. They now came out daily, as many as eighteen, eight of which were females, emerging on August 4th. The last specimen (a ♀) came out on the 10th, by which time I found myself in possession of a fine series of some four dozen or more specimens. It was but natural that I should seek to know more of the habits of such an interesting species, and therefore, while the imagines were emerging at home, some trips were undertaken to its chosen locality. On one occasion with my friend Mr. C. G. Barrett, who has also succeeded in rearing some specimens, we managed to disturb and secure a few specimens early in the evening, but as the evening advanced, the species was freely on the move, and several were netted. The flight of the male is strong and exceedingly wild, re-

sembling very much that of a *Miana*. As might be expected, a species with such powerful flight soon becomes worn, hence many of our captures were useless. The female seems to be very sluggish, almost as much so as that of *T. Lafauriana*, two or three only being observed on the wing.

Variability—remarkable deviations from the type have occurred in both sexes; indeed, the species is subject to considerable variation far more so, I believe, than has hitherto been supposed. In the ♂ the commonest form is that in which the colour of the fore-wings is of a brighter and paler red than that which usually obtains in its near ally, *Podana*. But specimens occur very much darker, some of them almost as black as the melanic forms of *Podana* found in the London district and elsewhere. In such specimens the patch of scales at the base of the fore-wings are silvery-white—certainly not of the normal yellowish or yellowish-grey tint. Occasionally specimens are met with very much paler than the type, and in some of these the markings are to a considerable extent lost. In the ♀ the colour of the fore-wing is generally somewhat paler than that which one finds in the same sex of normal *Podana*. Specimens however occur in which the fore-wings are of various shades of brown, in some of them of a dull pale brown, whilst in others the colour approaches that found in *T. dumetana* or very dark *T. heparana*, with darker reticulations and conspicuous costal spots of a very dark brown or black. This last described var. is remarkably handsome. A ready point of distinction from its near relative *Podana* is found in the colour of the apices of the hind-wings, which, in the ♂, are whitish or greyish-ochreous, and in the ♀, whitish-grey with a tinge of red, and *never* orange, as in both sexes of *Podana*. Another point of distinction, as previously noticed by Mr. Barrett (Ent. Mo. Mag., xxiv, p. 243), is the twice or thrice angulated line forming the anterior margin of the central fascia, whereas, in *Podana*, the same line *is not* angulated, but slightly curved or sinuous.

The larva, which is rather variable, and sometimes not very unlike that of *Podana*, may be described as follows:—

From 9 to 10 lines in length; active, of moderate thickness, tapering slightly towards the anal extremity, and somewhat flattened beneath. Dorsal region yellowish-brown, or greenish-brown, and a little paler between the segments. Spiracular region paler, with a still paler line below the spiracles. Head shining brown, jaws black. Dorsal plate shining brown or dark brown, its anterior margin white, and sometimes edged with white behind. Anal plate green or yellowish-green. Hairs of moderate length. Spots paler than the ground colour, but generally small and inconspicuous. A few of my larvæ, however, had the spots large and conspicuous, and these I believe produced females. Pupa blackish, with a tinge of brown in the wing-cases.

Larva between united leaves and shoots of *Myrica gale* (bog myrtle), and full fed at the beginning of July. It then usually quits its habitation to pupate amongst rubbish or dead leaves.

The larva of *T. Lafauriana* contents itself with drawing together the terminal leaves of a prominent or terminal shoot of its food-plant, which is also *Myrica gale*. But the larger and often irregular habitation of *T. decretana* (which is mostly concealed from view by being situated somewhere about the centre of its shrubby food-plant) is constructed of one or more of the lateral shoots and the remains of old flowering spikes. Of all the larvæ of *Tortrices* with which I am acquainted as selecting bog myrtle for a pabulum, that of *T. decretana* seems the most slovenly. So far as the United Kingdom is concerned, *T. Lafauriana* appears to be confined to this district. It would be odd, indeed, if *T. decretana* should be equally restricted in its range!

King's Lynn, Norfolk :

February 5th, 1889.

DESCRIPTION OF THE LARVA OF *HOMÆOSOMA NIMBELLA*.

BY GEO. T. PORRITT, F.L.S.

On August 16th, 1887, I found larvæ of *Homæosoma nimbella* feeding commonly in wild camomile flowers on the rocks near Douglas, Isle of Man; and on the 27th of the same month I described them as follows:—

Length, about one-third of an inch, and obese in proportion; head small, and, together with the frontal plate, is highly polished; it has the lobes rounded, and is considerably narrower than the second segment; body cylindrical, almost uniform in width, tapering a very little at the extremities. Ground-colour yellowish-green, varying in depth of shade in different specimens; head dark brown, but darkest on the upper part of the lobes; frontlet yellower-brown, with distinct intensely black border behind. The markings are all purple, and conspicuously defined; the medio-dorsal stripe appears rather irregular in outline, caused by slight interruptions made by the segmental divisions, and by a slight transverse depression on each segment; sub-dorsally is a pretty series of large round marks, one on each segment, the centre of each in some specimens being of the pale ground-colour, and so forming a ring-like mark, though in other specimens the "ring" appears to be almost filled up; below these, along the spiracular region, are other marks, usually three on each segment, one situate over two others, so that if extended to each other they would form a triangle. Ventral surface and prolegs very pale green, anterior legs black and glossy.

The first imago appeared on the 24th of June following.

Huddersfield: March 11th, 1889.

NOTES ON SOME VERY OLD SPECIMENS OF *LEPIDOPTERA*.

BY C. W. DALE, F.E.S.

Mr. Barrett, in the Ent. Mo. Mag., xxv, p. 223, in recording some old insects in the collection of the Rev. Henry Burney, has apparently fallen into some mistakes, which I will try to rectify, and also furnish some additional information.

“One is a very beautiful *Plusia*, obtained sixty years ago from Mr. Charles Dale, who had it from the collection of Dr. Abbott, a rather noted collector at the end of the last century.” “This specimen is *Plusia aurifera*, H.” “There is nothing to indicate whether the present specimen is the same as was formerly in Mr. Ingpen’s collection, or another.”

My father, who is above referred to, purchased the collection and manuscripts of Dr. Abbott, after his death in 1817. The Doctor’s diary commenced in 1798, and concluded in 1801; Abel Ingpen was born in 1796, and died in 1854. If the specimen came from Dr. Abbott’s collection, it is therefore a foreign one, and, consequently, was not valued by my father; had it been a British one, he would not have parted with it, and it would have been recorded both in Dr. Abbott’s manuscripts and also in my father’s.

Perhaps the following passage from Stephens’ “Illustrations,” *Haustellata*, vol. iii, p. 105, may throw some light on the subject: “One was taken near Dover by the late Rev. J. Lyon, and is now in the British Museum; the other was, I believe, found in the vicinity of the metropolis, and at present forms a prominent ornament of a collection at Manchester, having been rescued from oblivion by Mr. Ingpen.”

The specimen is not in the sale catalogue of Mr. Ingpen’s collection in 1855.

Mr. Barrett goes on to say, “Another of the specimens in question is a *Plusia illustris*, which also came from an old British collection.” I possess a couple which were given to my father by Dr. Leach, who informed him they were taken on Salisbury Plain by a Mr. Spratt in 1810. Mr. Burney’s specimen probably also came from Dr. Leach.

Mr. Burney’s specimen of *Agrotis subgothica* probably came from Mr. Raddon, of Barnstaple, the gentleman referred to by Mr. Doubleday.

Now I will refer to some in my own cabinet:—

Acontia solaris, var. *lucida*.—This species was taken by Mr. Stone

at Dover, in June, 1825; three others were likewise taken there, one of which I believe to be Mr. Burney's.

Catocala fraxini.—I possess a female with faded under-wings, taken by Mr. Storey at Boveridge, in Dorsetshire, as long back as 1740. It was given to my father by Mr. Storey's son, who was a schoolfellow of his.

Phytometra Haworthana.—Under this name I have an old example taken by Mr. Raddon near Barnstaple about the year 1820, lately recognised by Mr. Barrett as an interesting variety of *Sarrothripus ilicanus*.

Chariclea delphinii.—My specimen appears to be a hundred years old, damaged, and without an abdomen. It came out of the collection of old Dr. Lathom.

Eurhodope argyreus.—Taken at Dover by Mr. Leplastrier.

Glanville's Wootton, Sherborne, Dorsetshire:

March, 1889.

[The small moth sent me for examination by Mr. Dale as a type of *Micra Haworthana*, Westw. (*Phytometra minuta*, Haw.), was, I think, one of the most perplexing insects I ever saw. From light abrasion of the tips, the form of the wings was altered, while its markings were peculiar—a large, dark, triangular costal blotch on a creamy-white ground tinged with grey, and beyond it a *white* sub-terminal line. This last character probably led to its being taken for a *Noctua*, the line being rather similar to that in *Erastria fuscula*. On the other hand, the triangular costal blotch was quite a Torticiform character. The basal portion of the costa was, moreover, strongly arched, and structurally the moth had evidently nothing to do with the genus *Micra*, Gn. (*Thalpochares*, Ld.). It bore no resemblance whatever to Haworth's description of *minuta*, or to Noel Humphrey's figures of *minuta* and *Haworthana*, but after careful study and comparison with various species, I found that the white sub-terminal line coincided with a yellowish line visible in some varieties of *Sarrothripa revayana*, and that the blotch formed a portion of the usual fascia in that species, while its shape and other characters agreed, as far as they existed, in this very aged specimen.—C. G. B.]

Xanthia cerago and silago.—Will some of your numerous readers kindly give me the distinguishing features of this insect, both in the ova and larval stage, as I am anxious to be able to discriminate them.—A. E. HALL, Norbury, Pitsmoor, Sheffield: March, 1889.

DESCRIPTIONS OF TWO NEW SPECIES OF *LECANIUM* FROM CEYLON.

BY E. ERNEST GREEN.

*LECANIUM VIRIDE.**Ovum*—pale green, sparsely covered with a white waxy powder.Longer diameter, $\frac{8}{1000}$ of an inch.*Newly-hatched larva*—pale green, flat, regularly oval, longer diameter about twice the shorter. A broad indentation at extremity of abdomen, with a central pointed spine, and on each side a small conical tubercle ending in a long curved seta. Tarsi with four knobbed digitules. Antennæ terminating in a few short stout hairs.*Larva*—oval, longer diameter about three times the shorter. Pale green. Eyes minute, black, lateral. Abdominal cleft extending one-seventh the length of insect, terminating above in two small yellowish triangular scales, below in a triangular cavity, within which is a small white point. Two small indentations on each side corresponding to lateral stigmata, one situated anteriorly at about a quarter the length of the insect, the second about the middle, both of them marked by a small white point, which on the under-side is continued within the margin as a line of white powdery matter. Antennæ and legs fully developed but small, lying in shallow channels on under-surface of body. A few short hairs on lower part of abdomen. Rostrum terminating in a long, fine, brownish, setiform tube.*Adult ♂*—unknown.*Adult ♀*—bright green. Intestine showing through on dorsum as an irregular curved chain of oblong black spots, which, in the living insect, have a periodic undulating motion. Above smooth, moderately convex, slightly concave beneath. Irregularly oval; anterior extremity sub-acuminate. Abdominal cleft with thickened margin, terminating above in two yellowish triangular scales. Eyes submarginal, black. Margin of scale with an extended series of minute hairs. Antennæ and legs small, lying in channels; the antennæ with seven joints, the 4th longest, the three terminal ones shortest (Fig.); tarsi one-third shorter than tibiæ, with two short, broad digitules; two digitules on claws long, thin. Rostral tube brownish. Length, $1\frac{1}{2}$ — $1\frac{3}{4}$ lines; breadth, 1 — $1\frac{1}{4}$ lines.

NOTE.—The eggs are hatched very shortly after deposition. The young insects appear to remain for some time under the protecting scale of the parent. Under most of the adult insects may be found a pulverulent mass, consisting of the newly-hatched larvæ and the collapsed membranous coverings of the ova.

The species occurs on various trees in Ceylon, including *Cinchona*, orange, *Gardenia*, &c.; but it more especially affects the coffee tree, its connection with which has been so disastrous that in many parts of the island it has been necessary to abandon the cultivation of this product.

[This species is evidently allied to *L. hesperidum*.—J. W. D.]

LECANIUM MANGIFERÆ.

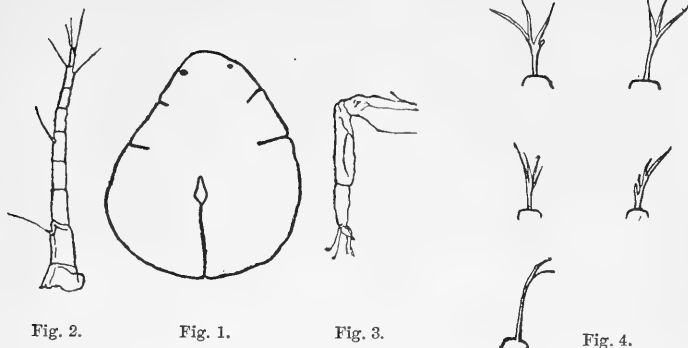


Fig. 2.

Fig. 1.

Fig. 3.

Fig. 4.

Ovum—oblong-oval, very pale green. Just before hatching the eyes of the larvæ are visible through the skin.

Newly-hatched larva—oval, dull pale yellowish; eyes dull red; abdomen ending in two rounded lobes, between which is a pair of conical tubercles giving rise to two fine setæ about half as long as the body of the insect. Antennæ with a few stiff hairs.

Half-grown larva—irregularly oval, broadest posteriorly, flat, very thin; with abdominal cleft, and lateral clefts above and below thorax. Margin with short, minute cleft or glandular hairs. Colour very pale green, in parts almost colourless. Eyes black. Anal scales triangular, yellowish. Remains of anal setæ visible on under-side as two short, opaque white threads, situated in a deep cavity below anal scales. Feet terminating in knobbed digitules.

Adult ♀—thin, smooth, flatly convex, irregularly triangular, or rather short oval narrow in front, very broad and rounded posteriorly. Marginal hairs not so conspicuous as in larva (Fig. 4). Posterior margin cleft to the small rhomboidal anal aperture, which is situated almost at the centre of the disc. Colour dull greenish-yellow. Eyes black, situated very close to margin. Feet with two knobbed digitules on the end of the tarsi and two on the claws. Abdomen concave below, forming a receptacle for the eggs. Rostrum with a long, thin, brown, hair-like sucking tube.

Size of insect, $2 \times 1\frac{1}{2}$ lines.

Male unknown.

I have at present noticed this insect only upon mango trees (*Mangifera indica*) in the district of Punduloya, Ceylon. It affects the under-sides of the leaves, but its presence may be detected by the usual black fungus that follows the attacks of nearly all insects of this Family, and in this instance gives to the tree an appearance as of having been thickly dusted with soot. It is very prolific; under one female I counted 54 eggs and eight newly-escaped larvæ, while the presence of numerous empty egg skins showed that other larvæ had previously left their shelter. The parent insect was still alive, and other eggs could be seen inside its body, which was almost transparent.

The young larvæ are very active, and may be seen wandering over the leaves. They commence to form the characteristic scale before finally settling down: they are then so extremely thin and transparent that they can only be detected when the light strikes them at an angle, when they appear as a thin film-like spot upon the leaves. Even the adult insect, when examined with transmitted light under a microscope, displays all its internal organs, and globules can be seen slowly circulating through its juices. Some specimens appear to the naked eye discoloured by a central dark spot; these are infested by a Hymenopterous parasite, which may be distinctly seen within the body of its host—in some individuals the larvæ, in others the pupæ or even imago ready to emerge. I have been unable to find the male of this *Lecanium*; it is probable that it is at present reproducing its kind by an asexual process (*cf.*, Ent. Mo. Mag., xxiv, p. 25).

Eton, Punduloya, Ceylon :

December 10th, 1888.

[With the foregoing Mr. Green sent a quantity of the dry scales attached to pieces of mango leaves, and they at once arrested attention by their form, like the outline of a median longitudinal section of a short pear, due to the dilatation all round the body, behind the head, of the marginal area, in which on each side, at and denoting the thoracic region, were two transverse incisions extending from the margin for a considerable distance inwards, and going through the substance of the scale. These scales strongly resemble *L. acuminatum*, except in the lateral slits, which are not mentioned or indicated by Signoret in his description and figure of that species (Ess. Cochin., p. 227, pl. xi, fig. 1). With the scales Mr. Green also sent excellent drawings of the living insects in all stages of growth, but these being coloured are not suitable for reproduction by the process here employed; moreover, separate enlarged figures of the antennæ and legs were wanting; these, with an outline of the scale (Fig. 1), have been supplied by the kindness of Mr. R. T. Lewis, to whom I am also greatly indebted for his practised aid in mounting and examining a number of specimens. The result is unexpected, for instead of the antennæ having seven joints, like *L. acuminatum*, as described by Signoret, the normal number in this species is eight (Fig. 2), as ascertained from a good many examples. It is true that in a few cases only seven joints could be seen, and then the long 4th joint mentioned by Signoret was apparent, but in the majority of instances instead of this so-called 4th joint, there were two distinct articulations. I apprehend that the appearance of the lesser number only is due to immaturity, and consequent shrinking; yet it may be that owing to the delicacy and transparency of the antennæ, the joint in question, like in some species of the other sectional divisions of the genus, occasionally, although present, is invisible. This will easily be understood by any one accustomed to observe delicate structures under a high microscopic power. The legs are also discrepant from those of *L. acuminatum*, for while in that species the tarsi are scarcely half as long as the tibiæ (a character on which Signoret lays special stress),

in this they are fully as much as, or even more than, half the length (Fig. 3). Taking all the differences into consideration, I think it must be allowed that this form constitutes a species distinct from *L. acuminatum*. The species is also allied to *L. hesperidum*, yet the possession of eight joints in the antennæ not only separates it from that, but also the other species associated by the possession of 7-jointed antennæ and agamic reproduction to form Signoret's 1st section of the genus. Not to believe this would be to impute an inaccuracy of observation to Signoret that I do not think is warranted; the lamentable nature of the malady under which unhappily he is suffering precludes a reference to him. *L. acuminatum* was obtained by Signoret on orchids in the hothouses of the Luxembourg.—J. W. D.]

[The *Lecanium* on mango leaves from Demerara, mentioned at p. 152 *ante* as *L. acuminatum*, proves to be *L. mangiferae*; the scales on the orchid were damaged too much for examination.—J. W. D.]

DIAGNOSES OF UNCHARACTERIZED SPECIES OF *DIABROTICA*.

BY JOSEPH S. BALY, F.L.S.

I.

Antennis articulis duobus brevibus, fere æquilongis.

DIABROTICA GUTTIFERA.

Anguste oblongo-ovata, postice ampliata, flava, nitida, pectore, tibiis, tarsis, scutello capiteque nigris, antennis basi sordide piceis, apice albidis, thorace lævi; elytris nigris, utrisque limbo laterali, postice abbreviato, maculis duabus infra basin, oblique transversim positis, undè subapicali fasciâque prope medium, utrinque abbreviatâ, albidis aut flavo-albidis. Long., 3½—4 lin.

Hab.: Cayenne.

DIABROTICA ILLIGERI.

Anguste ovata, postice paullo ampliata, convexa, flava, nitida, pectore, scutello capiteque nigris, facie plus minusve flavâ; antennis basi piceo-fulvis aut fulvis, articulis penultimis duobus albidis; tibiis, tarsis anoque piceis aut nigro-piceis, thorace lævi; elytris nigris, utrisque limbo basali, margine externo, maculis duabus infra basin, oblique transversim positis, fasciâ vix pone medium utrinque abbreviatâ, maculâque subapicali, flavo-albidis; ♂, antennis quam corpore paullo longioribus; ♀, antennis quam corpore vix brevioribus. Long., 3½ lin.

Hab.: Amazons.

DIABROTICA JAVETI.

Anguste ovata, postice ampliata, convexa, nigra, nitida, femoribus (apice extremo excepto) thoraceque flavo-fulvis; antennarum articulis penultimis duobus flavo-albidis; thorace obsolete bifoveolato; elytris tenuiter punctatis, utrisque maculis duabus rotundatis, infra basin positis, fasciâ pone medium, utrinque abbreviatâ, maculâque rotundatâ subapicali, albidis; ♂, antennis ad corpore fere æquilongis; ♀, antennis quam corpore brevioribus.

Long., 3½ lin.

Hab.: Brazil.

DIABROTICA BUQUETI.

Ovata, postice ampliata, convexa, flava, nitida, pectore antennisque nigris aut piceis, his basin piceo-fulvis, articulis penultimis duobus albidis, scutello labroque piceis; thorace rufo-fulvo aut flavo, convexo, lævi; elytris crebre punctatis, ad latera plicatis, utrisque lineâ suturali, alterâque subhumerali, ante medium abbreviatis, lineisque brevibus duabus, pone medium transversim positâ, nigris aut piceis.

Long., 3½ lin.

Hab.: Cayenne; Amazons.

DIABROTICA WESTWOODI.

Anguste ovata, postice paullo ampliata, convexa, flava, nitida, pectore, scutello, labro, antennisque nigris, his basi piceis, articulis externis tribus, ultimo apice excepto, albidis; thorace convexo, dorso leviter deplanato, basi foveâ obsoletâ impresso, elytris ad latera plicatis, utriusque lineâ suturali, a basi fere ad medium extensâ, vitta humerali brevi, maculâque oblongâ submarginali nigris.

Long., 3½ lin.

Hab.: Amazons.

DIABROTICA ATRILINEATA.

Ovata, postice sub-late ampliata, convexa, fulvo-flava, nitida, pectore, scutello capiteque nigris, antennis basi et apice flavis; thorace convexo, lævi; elytris tenuiter punctatis, utriusque suturæ basi, lineâ discoidali, utrinque abbreviatâ, vittâque submarginali, a basi fere ad apicem extensâ, callum humeralem amplectente, nigris.

Long., 4 lin.

Hab.: Brazil.

DIABROTICA NIGRITARSIS.

Anguste ovata, postice ampliata, convexa, flava, nitida, pectore, tibiis anticis apice, tarsis anticis orâque nigro-piceis; tibiis posticis quatuor apice, tarsis posticis, oculis antennisque nigris, his basi flavis, articulis penultimis duobus albidis; thorace lævi, elytris subfortiter punctatis.

Long., 3½ lin.

Hab.: Upper Amazons.

DIABROTICA DONCKIERI.

Anguste oblonga, postice paullo ampliata, convexa, nigra, nitida, femoribus basi flavis, facie thoraceque fulvis, hoc bifoveolato, plagis duabus nigris ornato; elytris nigris, utriusque limbo externo, lineâ suturali ab apice ad paullo ante medium extensâ, hinc ad basin oblique excurvatâ, fasciisque lineari-formibus duabus, unâ longe ante, altera vix infra medium positâ, flavo-albidis.

Long., 3 lin.

Hab.: Brazil.

DIABROTICA PECTINICORNIS.

Elongata, postice paullo ampliata, modice convexa, pallide flava, nitida, tibiis, tarsis capiteque nigris, antennarum articulo penultimo albido; thorace transversim excavato; elytris sub-crebre punctatis, nigris, limbo laterali, fasciâ

prope medium apiceque flavis; ♂, antennarum articulis intermediis pectinatis, penultimis duobus incrassatis. Long., $2\frac{1}{2}$ lin.

Hab. : Cauca.

II.

Antennarum articulo tertio quam secundo duplo longiori.

DIABROTICA VOLXEMI.

Ovata, postice ampliata, convexa, nigro-cuprea, nitida, antennis nigris; thorace bifoveolato, sub-crebre punctato; elytris tenuiter punctatis, fulvis, limbo externo, suturâ maculisque irregularibus, his illic inter se confluentibus, nigro-cupreis. Long., $3\frac{1}{2}$ —4 lin.

Hab. : Brazil (Van Volxem).

DIABROTICA CRUCIATA.

Oblongo-ovata, postice ampliata, convexa, nigra, nitida, femoribus thoraceque (hoc piceo tincto) flavis; antennarum articulis, 9 et 10, totis, 11 que basi albidis; thorace subarcuatim excavato, sulco utrinque magis profunde impresso; elytris flavis, utriusque plagis duabus magnis nigris. Long., 3 lin.

Hab. : Brazil; St. Catherina.

DIABROTICA SORDIDIPENNIS.

Anguste ovata, postice ampliata, convexa, nigra, nitida, capite thoraceque piceis, antennis basi, pedibus elytrisque sordide flavis; thorace sat profunde bifoveolato; elytris sat fortiter sub-crebre punctatis: ♂, clypeo profunde excavato, antennis filiformibus. Long., 4 lin.

Hab. : Cauca.

DIABROTICA BORREI.

Anguste oblongo-ovata, postice paullo ampliata, convexa, nigra, nitida, femoribus, antennis apice thoraceque flavis, hoc lævi, bifoveolato; elytris sub-crebre punctatis, limbo externo, apice dilatato, fasciâ latâ prope medium, suturâque ad apicem flavis. Long., 3— $3\frac{1}{4}$ lin.

Hab. : Brazil.

DIABROTICA GESTROI.

Ovata, postice ampliata, nigra, thorace capiteque rufo-fulvis, pedibus antennisque flavis; thorace bifoveolato; elytris sat-valde convexis, fasciâ communi prope medium extrorsum abbreviatâ, margineque apicali flavis; ♂, facie inferiori concavâ, antennis simplicibus; ♀, clypeo convexo, basi carinato. Long., 3— $3\frac{1}{2}$ lin.

Hab. : Eastern Peru.

DIABROTICA CAVICEPS.

Oblongo-ovata, postice ampliata, nigra, pedibus capiteque flavis, antennis extrorsum piceo tinctis; thorace rufo-testaceo, bifoveolato; scutello piceo; elytris convexis, basi, limbo externo apice ampliato, fasciâque mediali com-

munis flavis; ♂, *clypeo profunde excavato, concavo, antennis filiformibus*; ♀, *clypeo convexo, basi elevato vittato.* Long., $2\frac{1}{2}$ —3 lin.

Hab.: Amazons.

DIABROTICA TARSALIS.

Oblongo-ovata, postice ampliata, convexa, pallide flava, pectore, abdomine, antennis apice scutelloque nigris, thorace leviter bi-impresso; *elytris nigris, limbo externo apice paullo dilatato, fasciâque communi prope medium, pallide flavis*; ♂, *tibiis anticis incrassatis, tarsis ejusdem paris articulo basali ampliato.* Long., $2\frac{1}{2}$ lin.

Hab.: Bahia.

DIABROTICA EXCELSA.

Ovata, postice ampliata, sat-valde convexa, nigra, nitida, capite thoraceque rufo- aut piceo-fulvis, pedibus antennisque flavis, his apice tarsisque piceis; *thorace laevi, profunde bifoveolato*; *elytris distincte punctatis, obsolete elevato-vittatis, fasciâ mediali apiceque flavis*; ♂, *facie inferiori profunde excavatâ, antennis filiformibus*; ♀, *clypeo convexo, basi obsolete costato.* Long., $4\frac{1}{2}$ lin.

Hab.: Cauca.

DIABROTICA STAUDINGERI.

Elongata, postice vix ampliata, modice convexa, nigra, femoribus, thoracis superficie inferiori et lateribus, elytrorumque limbo externo, apice ampliato, flavo-albidis; *thorace crebre punctato, leviter excavato*; *elytris anguste oblongis, sub-crebre punctatis.* Long., 4 lin.

Hab.: Cauca.

DIABROTICA TORTA.

Ovata, postice ampliata, convexa, nigra, femoribus flavis; *antennis extrorsum elytrisque apice, sordide fulvis*; *thorace trifoveolato*; *elytris infra basin transversim excavatis, sat crebre punctatis, disco irregulariter corrugatis.* Long., $4\frac{1}{2}$ lin.

Hab.: Cauca.

DIABROTICA CORRUGATA.

Ovata, postice ampliata, convexa, nitida, subtus nigra, pedibus flavis, tarsis apice nigro-piceis; *supra pallide fulvo-picea, antennis extrorsum labroque piceis*; *oculis scutelloque nigris*; *thorace fere impunctato, arcuatim sulcato, sulco trifoveolato*; *elytris infra basin transversim depressis, tenuiter punctatis, disco laxè et irregulariter corrugatis.* Long., $4\frac{1}{2}$ lin.

Hab.: Cauca.

DIABROTICA RETICULATA.

Late ovata, ventricosa, picea, femoribus fulvis; *thorace lateribus angulatis, disco laevi, profunde bifoveolato*; *elytris basin transversim depressis, foveolato punctatis, interspatiis incrassatis, rete elevatum formantibus.* Long., 5 lin.

Hab.: Cauca.

The Butts, Warwick:

February, 1889.

ON A NEW *PIMELIA* BROUGHT BY MR. JOSEPH THOMSON FROM MOROCCO.

BY B. G. NEVINSON, M.A., F.Z.S.

PIMELIA THOMSONI, *sp. nov.*

Ovata, nigra, modice convexa, subnitida; capite antice rugose-punctato, supra leviter punctato, lateribus asperatis; thorace transverso, vertice fere impunctato, lateribus confertim tuberculatis; elytris ovatis, tuberculis plus minusve seriatim positis, obtectis, his tuberculis ad basim sæpius obsoletis, costis externis denticulatis. Subtus omnino granulata, femoribus tibiisque dense tuberculatis. Long., 13—16 mm.

Entirely black, somewhat shining. The head, roughly punctate in front, is almost smooth on the vertex, where only a few scattered punctures are visible, the sides being distinctly asperate. The thorax is short but broad, almost impunctate above, the sides covered with small but very distinct rounded tubercles. Scutellum very minute. Elytra regularly oval, covered with rather large rounded tubercles, arranged in fairly regular rows, two of these rows between the strongly marked suture and the costal margin being usually more distinct than the rest. In the majority of specimens at the base of the elytra near the suture the tubercles are flattened and tend to disappear, leaving a somewhat triangular plane surface. Towards the middle of the elytra the tubercles adjoining the suture often merge, producing transverse rugæ. The under-side of the insect is entirely covered with tubercles, minute, but very distinct on the abdomen, stronger on the metasternum. The femora and tibiæ also are thickly covered with tubercles; the tarsi being small and rather feeble. Antennæ moderately long and slender. The very scanty pubescence black.

Hab.: Glawr Atlas Mts., 6000—10,000 ft.

This *Pimelia* seems to be most nearly allied to the species inhabiting the Canary Isles (*serrimargo*, Woll., &c.), from all of which it is, nevertheless, abundantly distinct. Mr. Thomson seems to have met with it in some numbers, but only at high elevations of the Atlas range.

I have much pleasure in dedicating this interesting form to its discoverer, as some return for his kindness in presenting me with the *Coleoptera* collected by him in his adventurous journey through the heart of Morocco.

6, Tite Street, Chelsea, S.W.:

March 2nd, 1889.

Some insects common to Europe and Colorado.—To my list of insects common to Europe and Colorado (*ante*, p. 67), I have several additions to make: *Tachyporus chrysomelinus*, L., Western Custer Co.; *T. jocosus*, Say (Dr. Hamilton tells me this is found in Europe and Asia), Mesa Co., and S.W. Pueblo Co.; *Oxytelus nitidulus*,

Grav., W. Custer Co.; *Anthrenus scrophularia*, L., W. Custer Co.; *Meligethes brassica*, W. Custer Co.; *Formica fusca*, L., Swift Creek, Custer Co.; *Metrocampa perlata*, Guen., Swift Creek, Custer Co., this is considered to be *margaritata* by some authors, it seems to me at least a good variety. *Glaucopteryx cæsiata*, Bork., Wellsville, Fremont Co.; *Salebria fusca*, Haw., Badger Creek, Fremont Co.; *Menopon pallidum*, Nitzsch, W. Custer Co.; *Aspidiotus nerii*, Bouché (on imported lemons), Silver Cliff, Custer Co.; *Aphis brassicae*, L., W. Custer Co. Of course a large number of other species have been recorded by others; I learn from Dr. Hamilton that the *Coleoptera* common to Europe and recorded from Colorado are especially numerous. Many of our species may be termed representative; for instance, in W. Custer Co. we have *Arctia parthenos*, a *Caia*-like species of great interest, in which the ground-colour of the secondaries is ochreous-yellow much like some aberrations of *caia*; and *Smerinthus Astarte*, Streck. (which is said to = *ceriysi*, Kirby), taking the place of *ocellatus*. I have found what must be its larva on *Populus tremuloïdes*, but have not yet bred it, though I have obtained the perfect insect. The larva is apple-green, with the usual markings of a *Smerinthus* larva indicated in pale yellow. The anal horn is blue at the base above, but otherwise purplish inclining to pink, and with a black tip.—T. D. A. COCKERELL, West Cliff, Colorado: February 21st, 1889.

Two new species of Hemiptera on mistletoe.—In the "Revue d'Entomologie," Tome vii, pp. 365, 366 (1888), Dr. A. Puton has described the undermentioned two species of *Hemiptera-Heteroptera* taken on mistletoe (*Viscum album*) in the environs of Paris. These should be of special interest to British collectors, for it is not at all improbable that both may be found in England. The mistletoe is not common near London, but it abounds in Herefordshire, and occurs frequently in other counties; it has been but little visited by Hemipterists, and an investigation of it in July and August would be very likely to add these two species to the British list. The following notes present the chief *prima facie* characters of the species, and if any one is fortunate enough to obtain from the mistletoe *Capsidæ* at all accordant with these indications, further information as to details can be had by reference to the full descriptions, *l. c.*:—

Lygus viscicola, Puton.—Oval, pale yellowish; elytra covered with short, depressed, silvery pubescence, and crossed by two black-brown bands; membrane blackish with red nervures, and with four white spots. Length, 4 mm.

Resembles *Lygus limbatus*, Fall., and *L. adustus*, Jak., but is smaller, and without silky hairs and black points on the tibiæ; ranges best in the group of *campestris*.

Sthenarus visci, Puton.—Oval, almost truncate at the extremities. Above opaque-black, covered with scaly, silvery, pubescence; cuneus very declivous, the margin red; membrane black with grey nervures; wings shaded blue, iridescent. Length, 3 mm.

Has somewhat of the aspect of *Charagochilus Gyllenhali*, but belongs to quite another group, near *Agalliastes*.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: March 11th, 1889.

Aleurodes ribium, Doug., ? = *A. vaccinii*, Künnow.—When I investigated the characters of the larva and pupa of *A. ribium*, which are attached to the under-side

of the leaves of black and red currant bushes (*Ribes*), I could not find that they agreed with those of any described species to which I referred; I, therefore, concluded that the species was new, and described it accordingly, Ent. Mo. Mag., xxiv, p. 265. But I had overlooked *A. vaccinii*, the larva and pupa of which are attached to the under-side of the leaves of *Vaccinium uliginosum*, near Königsberg, described by Herr G. Künow in the "Entomologische Nachrichten," vi, p. 46 (cf. Ent. Mo. Mag., xvii, pp. 89, 90); and now, having had this description casually under my notice, I see that it is suspiciously accordant in many respects with *A. ribium*, and I am sorry that I had quite forgotten it. It apparently differs, however, in that the pupa is stated to be sharply raised on the upper-side, and the margin is broad and flat; while in *A. ribium* the pupa is not *sharply* raised on the upper-side, the broad marginal field sloping gradually up to the ring of small tubercles surrounding the flattened disc, which latter is not mentioned. The difference of the food-plants is also to be noted, *Ribes* and *Vaccinium* being in distinct Natural Orders not nearly related. It is, however, possible that these so-deemed different species of *Aleurodes* may be but one, or there may be two, similar, but distinct; this can scarcely be determined without actual comparison of the living insects; and it is only right to call attention to the matter. Nothing satisfactory would be obtained from an examination of the winged forms.—ID.: *March 2nd*, 1889.

The Dipterous destroyer of Icerya Purchasi.—At p. 235, *ante*, I said that neither the *Coccinella* nor the Dipteron that prey on the *Icerya* in South Australia had been determined. But it appears that this was an error, as far as the Dipteron is concerned, for Miss E. Ormerod has had the kindness to direct my attention to No. 1 of "Insect Life" (a monthly periodical, edited by Prof. Riley and his assistants, published by the U. S. Department of Agriculture), in which, at p. 21, the insect is described by Mr. S. W. Williston, with a figure, as a new genus and species, under the name of *Lestophonus iceryæ*. It is stated that the species has been artificially introduced into California from Adelaide, doubtless with the hope and expectation that it will be of effectual service in the destruction of the *Icerya* that so greatly afflicts that region, and we shall hear in due time of the result of the experiment.—ID.: *March 4th*, 1889.

Sound produced by Hylophila prasinana.—Among some Botanical books and papers formerly belonging to the late collector, H. J. Harding, I find a note in his writing on the stridulation of the above moth. It is written in pencil on old and soiled paper, and is very illegible, but I have deciphered it as follows:—

"On a beautiful evening at the end of June, 1852, in the locality of Darent Wood, I had just pinned my first insects taken at sugar when I heard a strange sound behind me, and on looking round observed what I thought was a beetle flying round a willow bush; when in my net it again repeated the sound, but what was my surprise upon finding it a Lepidopterous insect. I had now got it between my thumb and finger to give it an entomological pinch, when it again produced the sound; the deadly pin was now presented, and with the aid of my lantern, I found it was a common *Halias prasinana*. But it was a fact new to me: I had never, during thirty years entomologizing, heard of such a thing before. The sound was as if you passed a pin sharply along three or four teeth of a comb. I suppose it was a love song to charm his lady."

It is quite possible that many insects are capable of producing sounds, but these sounds may be inaudible to some of us ; for, as Dr. Carpenter observes : "There is a different limit to the acuteness of the sound of which the ear can naturally take cognizance in different persons ; if the sound be so acute (high in pitch) that the *membrana tympani* will not vibrate in unison with it, the individual will not hear it, although it may be loud ; and it has been noticed that some persons cannot hear the very shrill tones produced by particular insects, or even birds, which are distinctly audible to others" (Ani. Phys.).—C. G. HALL, 14, Granville Street, Dover: *March 6th*, 1889.

Note on Eupithecia extensaria.—Our fortunate discovery, in 1887, of *Eupithecia extensaria* on this coast was duly followed in September by the discovery of its larva feeding, as we expected, upon *Artemisia maritima*. It is a pretty larva of a rather bright green with whitish longitudinal lines, the subdorsal and spiracular lines being broad, and one along the ventral area narrow. The spiracular line is also more or less edged below with pinkish-brown. Head green, with pinkish-brown mouth, legs also pinkish-brown, claspers green, swollen and glossy. The entire larva is a *combined plan of mimicry*—its body is striped precisely like the curiously grooved sprays and leaf-stalks of the *Artemisia*, which exhibit, alternately, green skin and white down, the pinkish-brown mouth and feet, drawn together when the larva is at rest, exactly resemble the opening buds of the plant, and the two pairs of tumid claspers at the hinder extremity resemble in an extraordinary degree the thickened, rounded segments of the leaves. This last-named resemblance seems, at first sight, unnecessary, but its value is demonstrated by the discovery that this larva has a habit—which I have never observed in any other species—of standing, apparently, *upon its head*, that is to say, laying hold with its thoracic feet and extending its body stiffly so that its hinder extremity is in the air. This, however, is only an occasional practice, and during the day time it generally remains close to the stem, twisting itself among the leaves and blossoms, but, at night, feeding voraciously on both. When full-fed it descends to the ground, where it makes a tough cocoon, and changes to a pretty stumpy pupa of a chestnut-brown, with bright green wing cases.

The moths emerged in June and July, almost every larva producing an imago. Not a single parasite occurred among them.

This species seems to be gregarious or excessively local in its habits, frequenting sheltered clumps of the food-plant, but not extending its range very far, although the *Artemisia* is plentiful on the coast. This excessive localism may be habitual with the species, or it may be an indication that it is quite a recent immigrant to our coasts, and this last view I am inclined to favour, partly from the present immunity of the species from parasites, but still more from the circumstance that so acute and energetic a worker as Mr. Atmore had not previously observed it. He and I think it impossible that he should have so long overlooked it. I may add that from this gregariousness the species might probably be easily exterminated. We do not propose to effect this, and I think that we shall have the sympathy of all real Entomologists in our resolve not to give any one else facilities for doing so. We are making the species pretty extensively known, for this is one of our handsomest "Pugs." Larvæ were again secured last September, by which our friends will probably benefit by and by.—CHAS. G. BARRETT, King's Lynn, Norfolk: *March 9th*, 1889.

Phlaodes Demarniana in Norfolk.—I have several times remarked upon the extreme scarcity in recent years of *Phlaodes Demarniana*, as compared with its comparative commonness many years ago, and have carefully recorded some of its recent and rare occurrences, especially in this district. Last summer, however, from some totally inexplicable cause, it suddenly made its appearance in all directions, not plentifully, but in sufficient numbers to enable us to fill our own series, and to supply specimens to many of our friends. Nearly all were beaten out of birch trees of good size, and I think it probable that the species habitually frequents the higher branches of the trees, whence it cannot easily be dislodged.

While searching for this species on one of our marshy heaths, I had the good fortune to secure a specimen of the very rare *Grapholitha ravulana*, H.-S. (*obscurana*, Steph.). No moth could well be more obscure in its appearance both when on the wing, and in its markings when captured.—ID.

Lepidoptera at Armagh in 1888.—The summer of 1888 did not prove so productive of butterflies as that of 1887; *Vanessa Atalanta*, *V. cardui*, and *Argynnis Paphia* were entirely absent. Moths were tolerably plentiful, and I managed to add a few to the Armagh list. Mrs. Johnson had dug some pupæ in the autumn of 1887, and from these emerged, among other things, four fine specimens of *Smerinthus populi*, one of which Mr. W. F. de V. Kane informs me is a typical Irish var., also *Notodonta ziczac* and *Dianthæcia nana* (*conspersa*), these last I had not observed here previously. Sugar attracted plenty of moths (also earwigs), but they were mostly the commonest species. I took some very dark (almost black) specimens of *Xylophasia monoglypha* (*polyodon*), which, together with *Triphæna pronuba*, was a perfect nuisance. Along with these I took *Leucania comma*, *Axylia putris*, *Apamea fasciuncula*, *Cucullia umbratica*, *Plusia festucae*, *P. gamma*, *P. pulchrina*, *Hadena pisi*, *H. oleracea*, *Xanthia fulvago* (*cerago*), *Triphæna fimbria*, *Acidalia bisetata*, and *Eupithecia sobrinata*. In a lane where there was a good deal of privet I took *Hepialus velleda*, *Euplexia lucipara*, *Larentia didymata*, and *Melanthia albicillata*. A couple of hours at Churchill procured me *Cænonympha Typhon* = *Davus*, *Nemeophila plantaginis*, *Larentia salicata*, and *Aspilates strigilaria*, of which last I took a good series, exhibiting considerable variety of marking. A fine specimen of *Charocampa Elpenor* was brought to me in July by one of the pupils at the Royal School, and on October 14th, a specimen of *Macroglossa stellatarum* flew into my house and was duly captured. I got a couple of *Nonagria typhæ* from pupæ taken out of stems of *Typha latifolia*, but, owing to the heavy rain, the bogs were very much flooded, and the reeds almost unapproachable. The moths emerged on 9th and 11th September. The wet autumn hindered pupa-digging to a great extent, and the few attempts made proved very unproductive.—W. F. JOHNSON, Winder Terrace, Armagh: March 6th, 1889.

Coleoptera at Armagh in 1888.—Since my last notes (p. 19 of present volume) I have been working away with more or less success. On May 9th I took from moss in a marshy part of the Mullinures, forty-three *Erirhinus æthiops*, and, on the same occasion, captured a nice example of *Myrmedonia collaris* also in moss. Later on in the month I took, in the same productive locality, *Aleochara mæsta*, *Mycetoporus*

longulus, *Corymbites quercus*, and the var. *ochropterus*, *Galeruca tenella*, *Hypera Pollux*, *H. rumicis*, and last, but not least, *Dytiscus circumcinctus*. I was very pleased to get this specimen, which was a fine ♀, as I had long expected to meet with it here, and had been disappointed at its non-appearance. Lowry's Lough produced a *Mycetoporus* which is, I think, *angularis*, *Trogophloeus arcuatus*, and one example of *Gymnetron villosulum*. June is mostly a productive month at Lowry's Lough, but the Water Commissioners, imagining that we were to have a water famine, had taken such care of the supplies that the Lough was full to the brim at a time when it is usually half empty. A few *Pelophila* and one or two *Blethisa* only were to be got, but sweeping the herbage and some low-growing willows produced *Crepidodera aurata*, *C. helxines* (one) and *Galeruca lineola*. Under stones were *Staphylinus erythropterus* and *Philonthus quisquiliarius v. dimidiatus*.

The water net brought me *Caelambus 5-lineatus*, as usual *ad lib.* (*C. versicolor* evidently objects to Armagh water), and *C. 9-lineatus*. This last I get at a particular spot at the margin of Lowry's Lough where the bottom is gravelly and stony. It seems to keep down amongst the stones altogether, only leaving the bottom in order to renew its stock of air. I found the best plan was to stand quiet and watch for one to move from one stone to another or come to the surface, and then in with the net as fast as possible.

By sweeping in the Mullinures I took *Priobium castaneum* and *Balaninus brassicae*.

On the 27th I made an excursion to Lough Neagh, stopping, as usual, at Churchill, where I got *Adimonia suturalis* and *Rhynchites betulae*. At Lough Neagh I took *Eriirhinus aethiops* by sweeping herbage on the sides of drains. As Derrywarragh was tenanted by a bull of unknown fierceness, and what a boy obligingly informed me was a "sticking cow," Mrs. Johnson and I thought it prudent to beat a retreat. We were then rowed over to Coney Island, where I took *Pelophila borealis*, *Chlaenius vestitus*, *C. nigricornis*, *Orechochilus villosus*, which I disturbed from roots of plants at the water's edge, *Philhydrus coarctatus*, *Philonthus quisquiliarius v. dimidiatus*, *Aphthona lutescens* and *Nanophyes lythri*. Rain unfortunately came on so heavily that I was obliged to leave off collecting, otherwise my list would probably have been longer.

July and the first few days of August I spent at Carlingford, and I have recorded my captures (p. 139).

August and September were almost blank, nothing new turning up except *Crepidodera salicariae*.

In October I was much pleased at getting a specimen of the handsome *Donacia dentipes* in moss from the margin of a little lake called Drummond, while in moss from the Mullinures I got *Cassida obsoleta*, and at Loughnashade, a small lake close to the site of the ancient Emania, I took *Evasthetus laeviusculus*.

Moss in November brought me, besides a host of the commoner kinds, *Tachyporus brunneus*, *Philonthus proximus*, Kr. (*succicola*, Thoms.), *Xantholinus longiventris*, *Sunius intermedius*, *Stenus declaratus*, *Euplectus ambiguus*, *Scymnus testaceus*, Mots. (*Mulsanti*, Wat.), *v. limbatus*, Steph. of *S. suturalis*, Thunb. (*discoideus*, Ill.), *Thyamis obliterata*, *T. lurida* and *T. atriceps*.

In December the beetles got their Christmas holidays as I was too busy with other things to interfere with them at all. Last month I did my best to make up for

lost time and kept the moss bag going with vigour. The weather was mild and the moss abounded with beetles. My principal captures were :—*Notiophilus palustris*, *Archomenus gracilis*, *A. piceus*, *Olisthopus rotundatus* (its first appearance here. I have taken it on Carlingford mountain several times), *Bembidiun Clarki* (both light and dark forms), *B. Mannerheimi*, *B. obtusum*, *Pterostichus strenuus*, *P. diligens*, *Conosoma lividum*, *Tachyporus brunneus*, *T. nitidicollis*, *Mycetoporus splendidus*, *Megacronus cingulatus*, *Philonthus varians*, *P. nigrita*, *Cryptobium glaberrimum*, *Lathrobium longulum*, *Othius melanocephalus*, *Sunius diversus*, *Slenus aërosus*, Er. (I think), *S. flavipes*, *S. bimaculatus*, *Oxytelus laqueatus*, *Agathidium lævigatum*, *Hypera rumicis*, *H. trilineatus* and *H. nigrirostris*. There is a point about this last which I should like to mention, as it may gain me information. I several times took in moss what I supposed to be a dark brown *Hypera*, but always found bright green *H. nigrirostris* when I went to look at them after death. I thought it was probably from my not looking carefully when taking the specimens, or from the cyanide with which I killed them, so the other day in broad daylight, not by lamplight, I selected two of these brown weevils and put them in a bottle and placed the bottle in a dark press. I have just looked at them and they are bright green. Is, therefore, the dark brown the immature form of *H. nigrirostris*?

It will be seen from the above account that moss here is very productive, in fact, I find it one of the best means of getting specimens. It is extremely plentiful and luxuriant, and I never have any difficulty in getting as much as I care to carry. I notice that the fern-like moss (I do not know its scientific name) has generally more beetles in it than other kinds.—ID. : February 2nd, 1889.

Læmophlæus pusillus, Schön.?—A few months ago, amongst some old pollard and bran, I found a species of *Læmophlæus* which I was unable to determine satisfactorily from Cox's Handbook of British Coleoptera. I forwarded some specimens to my friend Mr. Newbery, who concurred with my opinion with regard to their distinctions from the species in the above-named work, and, at the same time, suggested that they might be *pusillus*, Schön., a species introduced in Dr. Sharp's Catalogue of British Coleoptera, 2nd Edition, but, apparently, not described; except a note by the Rev. W. W. Fowler (Ent. Mo. Mag., vol. xxiv, p. 52) stating that the insect had been taken by Mr. Fitch amongst imported corn at Maldon, Essex, and that it was rather larger than *L. duplicatus*, to which it was somewhat closely allied, and distinguished by having only one impressed line on each side of the thorax, and by the fact that the antennæ of the male were almost as long as the whole body, the elytra also being more plainly striated and the general form broader. I have carefully examined my specimens and compared them with authenticated types of *duplicatus*, Walzl, and *ferrugineus*, Steph., and from the former they may be at once separated by the characters given by Mr. Fowler; the elytra also appear to be more parallel-sided. In the case of *ferrugineus* it is more difficult, as the females are very much like that species, but the thorax is less narrowed behind. The male, of course, is easily distinguished from all the other British species by the length of the antennæ. I forwarded some of the beetles to the Rev. W. W. Fowler, stating my idea about them, and he replied "I am nearly certain the *Læmophlæus* is *pusillus*, but, unfortunately, I seem to have mislaid my specimen." *Læmophlæus testaceus*, Fab., No. 1147 in Stephens' "Manual," seems evidently to refer

to *pusillus*, and he gives the habitat, "in flour, &c. : London and Norwich." There is a figure in his *Illustrations, Mandibulata*, iv, 224, plate xxi, fig. 6.—C. G. HALL, 14, Granville Street, Dover : *February 27th*, 1889.

On the position of Chimarrha.—In a note at page 90 of vol. xxiv, reference is made to the discovery, by Dr. Fritz Müller, of the pupa of a Brazilian species of *Chimarrha*. The original record will be found in the "Entomologische Nachrichten" xiii, No. 15, August, 1887, where Dr. Müller states that, on account of the peculiarities possessed by the pupa and case, the insect is certainly no Rhyacophilid but a Hydropsychid, a view which Mr. McLachlan, in the note above mentioned, also supports. Through the kindness of Dr. Müller, I have just received a number of papers bearing on the *Trichoptera*, and amongst these is a second note on *Chimarrha*, (Ent. Nach., xiii, 289—290) in which a figure is given of the labrum of the larva. The first glance at this figure suggested relationship to *Wormaldia* and *Philopotamus*, an impression which was confirmed by perusal of the text. The labrum of the larva in the two last named genera, and the same part in that of the *Chimarrha*, certainly belong to one and the same type; and there is also agreement in the antennæ, colour, habits, &c.

Dr. Müller's comparison of the neuration of the *Chimarrha* with that of *Wormaldia subnigra* is also of some significance.

All the points above noticed seem to me to have a bearing on the position of *Chimarrha* in the family where it now finds a resting place, supposing the Brazilian insect is really a true ally of our *Ch. marginata*.—KENNETH J. MORTON, Carlisle, N. B. : *January*, 1889.

Obituary.

Jacques Charles Puls, a chemist at Ghent, one of the oldest members of the Belgian Entomological Society, died at Ghent on January 13th. He was a member of most of the Entomological Societies of Europe; of that of London since 1870. He published but little, and almost exclusively on *Hymenoptera*. But he formed a vast entomological library, possibly unique of its kind in Belgium, and we hear with regret that it is likely to be dispersed by sale by auction.

The Rev. John George Wood, M.A., died while on a lecturing tour, on the 3rd March, at Coventry, after a few hours' illness. He was born in London in 1827, and graduated at Merton College, Oxford, and was ordained in 1852. For a time he was attached to the seamen's floating chapel, and was also chaplain to St. Bartholomew's Hospital. But he soon practically abandoned clerical duties, and devoted himself to writing popular works on Natural History, and delivering popular lectures on the same subject. In this he was very successful, and probably no other writer of works of a kindred nature has been so widely read, though, unfortunately, his books are often marred by a want of scientific accuracy. His eldest son, Mr. Theodore Wood, is well known as a successful collector and student of British *Coleoptera*, and also as the author of several works on elementary and economic Entomology.

Review.

THE BUTTERFLIES OF NORTH AMERICA: by W. H. EDWARDS. Third series, Parts vi and vii. Houghton Mifflin and Co., Boston and New York; and Trübner and Co., London. 1888—1889.

Part vi contains *Papilio Nitra*, Edw., *Anthocharis lanceolata*, Bdv., and *Genutia* Butler, with a multitude of figures of the various stages, and *Neonympha areolatus*, Abb. and Sm., also with a multitude of figures. Part vii is made up of *Anthocharis Rosa* and *Pima*, Edw., *Erebia fasciata*, Butler, and *discoidalis*, Kby., and *Geirocheilus Tritonia*, Edw. All these latter are species of which the earlier stages are yet unknown, and some of them are of great rarity.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, February 28th, 1889.—T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Miss K. M. Hinchliff, of N. Devon, Messrs. J. F. Perry, of Birmingham, J. Smith, of Woolwich, W. H. McLachlan, of Clapham, G. J. Randall, of Brixton, H. Moore, of Rotherhithe, and A. Nott, of Clapham, were elected Members.

Mr. Robinson exhibited varieties of *Agrotis segetum*, Schiff., and *A. exclamationis*, L., from Hunts. Mr. R. Adkin, *Anerastia lotella*, Hb., from Forres, Norfolk and Kent; *Dioryctrea abietella*, Zinc., from Forres and Kent; *Crambus dumetellus*, Hb., from Forres; with *C. pratellus*, L., and *C. dumetellus*, Hb., and *C. ericellus*, Hb., for comparison, and called attention to the close resemblance of the Forres *dumetellus* to the Kentish *pratellus* in colour and size, but not in markings. Mr. Tutt asked whether the specimens of *D. abietella* were taken in the neighbourhood of firs, as Mr. Coverdale had taken a specimen at Shoeburyness, and, about three years since, another had been recorded in the Ent. Mo. Mag. as having been taken at Portland. Mr. Adkin said he thought it difficult to prove that there are no firs in any locality as they were largely used for ornamental gardens. Mr. Manger exhibited *Coleoptera* from Dargeeling. Mr. T. R. Billups, three rare and local *Arachnida*: *Heliophanus flavipes*, C. Koch., *Ballus depressus*, Walck., *Pachygnatha Degeeri*, Sund., and forty other species.

March 14th, 1889: J. T. CARRINGTON, Esq., F.L.S., Vice-President, in the Chair.

Mr. A. Horne, of Aberdeen, was elected a Member.

Mr. Adye exhibited specimens of *Dasycampa rubiginea*, Fb., and varieties of *Xanthia flavago*, Fb., taken in Hampshire. Mr. R. South, a darkly coloured specimen of *Zygæna filipendulæ*, L., and what he thought was a variety of *Hadena dentina*, Esq. Mr. P. Russ, a number of species taken in the neighbourhood of Sligo, Ireland, including many varieties and local forms, and an interesting series of varieties of *Aporophila lutulenta*, Bork. Mr. R. Adkin, two dwarfed specimens of *Lycæna Corydon*, Fb., and other British *Lepidoptera*. The Secretary read a note from Mr. T. D. A. Cockerell, on *Pyrausta borealis*, Randall, and an aberration of *Dermestes fasciatus*, Lec. Mr. Tugwell read a paper, "Practical hints on breeding Macro-Lepidoptera."—H. W. BARKER, Hon. Secretary.

ENTOMOLOGICAL SOCIETY OF LONDON: *March 6th*, 1889.—The Right Hon. Lord WALSHINGHAM, M.A., F.R.S., President, in the Chair.

The Rev. W. F. Johnson, M.A., of Armagh; the Rev. C. F. Thornehill, M.A., of Burton-on-Trent; and Mr. C. R. Straton, F.R.C.S., of Wilton, were elected Fellows.

Mr. F. P. Pascoe exhibited several specimens of the Saüba Ant (*Ecodoma cephalotes*), from Pará, carrying portions of dried leaves. It seemed questionable whether the leaves were collected by the Ants for the purpose of making their nests or for the sake of some fungus which might be growing on them.

Mr. Jenner Weir exhibited, and read notes on, specimens of a Butterfly (*Tirumala Petiverana*) from Mombaza, Eastern Africa.

Mr. J. H. Durrant exhibited a living larva of *Cossus ligniperda*, which had entirely lost its ordinary colour and had become first pink and then white. He attributed the change and subsequent loss of colour to the fact that it had been deprived of its natural food and fed for eighteen months on pink paper, with which the box in which it was kept was lined, and subsequently on white cardboard. Mr. McLachlan remarked that the most extraordinary peculiarity about this larva, in addition to the loss of colour, was the absence of the usual odour of *Cossus*. Lord Walsingham observed that it was questionable whether the colours of larvæ were dependent on the colours of their surroundings, or whether they were affected by the contents of the intestinal canal. Prof. Meldola said that the caterpillar exhibited having eaten the pink paper had most probably become dyed by the colouring matter, and he did not think the observation had much bearing on the question of the protective colouring of caterpillars. It was well known to physiologists that certain dye-stuffs could be introduced into the tissues of animals by mixing the colouring matters with the food, and paper was frequently stained with coal-tar dyes such as eosin, magenta, &c., so that it was simply a case of direct dyeing of the larva.

Mr. B. A. Bower exhibited a specimen of *Parasia neuropterella*, bred from heads of *Centaurea scabiosa*, and said he believed the species had not been previously bred. He also exhibited series of *Coleophora olivaceella*, *C. solitariella*, and *Laverna subbistrigella*.

Mr. White exhibited a series of male and female specimens of *Orgyia thyalina*, belonging to Mr. Leech, and obtained by the late Mr. H. J. Pryer in Japan. Some of the females had their wings fully developed, and some of them were semi-apterous, as is usual with the females of this genus.

Lord Walsingham exhibited specimens of preserved larvæ of *Eupithecia extensaria*, from King's Lynn, Norfolk; also a preserved larva of *Smerinthus ocellatus* and one of *Sphinx ligustri*. The larva of the last-named species was a variety, and the President remarked that it was the only variety of this species he had ever seen.

The Secretary read a communication from the Rev. Dr. Walker, announcing his intention of making an expedition to Iceland this year, from the 23rd June to the 29th July, and asking that any Entomologists who might wish to accompany him would send him their names.

Mr. Gervase F. Mathew communicated a paper entitled "Descriptions and Life-Histories of new species of Rhopalocera from the Western Pacific."—H. Goss, *Hon. Secretary*.

GENERIC NOMENCLATURE IN ENTOMOLOGY.

In a meeting held on the 13th January, 1889, at Leiden, the Netherland Entomological Society discussed a question which will, undoubtedly, be considered by every Entomologist as one of the highest import, viz.: the present movement to change generic names and to introduce new names for those which, established by long use, are generally adopted in the science of Entomology—a movement which, if not checked in time, will give rise to much confusion and all sorts of mistakes.

On a previous occasion the Society had appointed a Committee of some members to examine the matter. In the aforesaid meeting this Committee read the following Report:—

“In the meeting of the Netherland Entomological Society, on the 22nd January, 1888, at Leiden, a Committee was appointed to inquire whether or not the Society ought to support the movement in the Entomological Nomenclature to change generic names hitherto in use, for older names or for quite new ones.

“The Committee has the honour to lay before the Society the the following report on this question:—

“The Committee is unanimously of opinion that the ever swelling tide of synonymy must indeed be considered as a real calamity for science; that the nomenclature ought to possess the greatest possible degree of stability, in order to prevent confusion of genera and species; and that, therefore, *a priori*, generally adopted names should not be changed *without important reasons*.

“As Linnæus was the first to fix the unsurpassed binary nomenclature, the Committee is of opinion that the year 1751 ought to be taken as the commencement of the systematic literature; this being the date of the publication of the ‘*Philosophia Botanica*,’ where the binary system (Latin or Greek generic and specific names) was for the first time applied to Botany.

“The Committee is quite ready to admit that some older naturalists, Tournefort, Klein, &c., were already before Linnæus aware of the necessity of a binary nomenclature to indicate the objects of the organic world, and occasionally applied it; the Committee moreover acknowledges that Linnæus more than once, without any explicable reason, has not given due honour to the great merits of his eminent predecessors, who—as is proved by Agassiz in his ‘*Revision of the Echini*’—were far in advance of him in the knowledge and classification of some groups of animals; but the systematic application of this

method is due to Linnæus, who applied it for the first time to Zoology in the Xth edition of his *Systema Naturæ* (1758).

"It need, however, [not] be said that the merits of these older naturalists remain intact, although the names given by them are no longer used, and that we may acknowledge their just claim to estimation on our part by adding the names of their genera and species as synonyms.*

"The Committee, therefore, thinks that the following ought to be laid down as general rules:—

"I. *The oldest name, given according to the binary system to some genus or species, must be maintained.*

"Consequently, no further consideration need be given and no use may be made of—

"(a) Names, either Latin or Greek, which are given to any genus or species before 1751, because the binary system was not used at that time.

"(b) Names given after 1751, to which the binary system was not applied.

"The reason that the Committee has chosen the year 1751 as the commencement of the systematical literature, and not 1758 (when appeared the Xth edition of the *Systema Naturæ*, in which Linnæus for the first time has given names to the species of animals, instead of the numbers used before that time), is that it wishes to secure the right of priority to the authors, who, like Clerck, in his '*Aranei Suecici*' (1757), during the period of seven years between the publication of the *Philosophia Botanica* and the Xth edition of the *Systema Naturæ*, wrote works on Natural History in which they used the binary nomenclature.

"There are authors who, even after 1751, followed the old method, pointing out, for instance, a genus by a Latin name, but indicating the species either by a number, a short description, or a name in one of the modern languages. This was, among others, the method of Geoffroy in his well-known '*Histoire abrégée des Insectes*,' which appeared in 1764, notwithstanding he knew the Linnæan system. Though fully alive to the great merits of the said author, whose excellent illustrations and accurate descriptions of genera and species have rendered such important services to the science of Entomology, yet the Committee does not think it right, on account of the above-mentioned reasons, that the generic names, used by him, should obtain a place in the

* A verbatim copy, but vague in its wording: the word in brackets should probably be suppressed.—Ebs.

system. Hence, if subsequent authors should give to some genera the names used by Geoffroy, they must mention as the name of the author not Geoffroy's but that of the author, who first added to such a generic name, a Latin or Greek name of the species, for, '*perfecte nominata est planta nomine generico et specifico instructa*' (Linnaeus). We may, however, acknowledge the merits of Geoffroy, by adding, as it is said above, as a synonym, the name which is used by him.

"II. *If some existing genus must be divided into more genera, the original name must be applied to that division which was considered by the original author as the most typical.*

"If the genus, according to the first description, contains a single species, or if the author has indicated a peculiar species as its type, the application of the above-mentioned rule will not offer any difficulty. If, on the contrary, several species are included in a genus, and none of them has been indicated as the type, the decision is more difficult, and every case must be judged by itself. In such a case many authors seem to be inclined to consider as type of the genus the first species which is found in the locality where the author lives, but it may be doubted whether this view of the matter is in accordance with the author's intention.

"The conclusion at which the Committee has arrived is that, on account of the above-mentioned reasons, this substitution of existing and generally adopted names for those introduced in the '*Catalogus Coleopterorum Europæ*,' by Dr. L. von Heyden, E. Reitter and J. Weise (ed. III, 1883), and in M. des Gozis '*Recherche de l'espèce typique de quelques anciens genres*' (1886), cannot be justified, and will cause only needless confusion in the entomological literature.

"Leiden, Hague :

December, 1888."

"R. HORST, Phil. Dr.

A. F. A. LEESBERG, Jur. Dr.

C. RITSEMA Cz.

A long discussion followed the reading of this report, but the method, introduced by the authors of the 3rd edition of the "*Catalogus Coleopterorum Europæ*," and by Mr. des Gozis, did not find a single defender among the members present. Some of them were of opinion that the evil ought to be resisted not only with respect to the generic, but also to the specific names. Others held that we ought not to confine ourselves to Entomology only, but that Zoology in general is interested in the matter.

Finally, the meeting approved unanimously the conclusions of the report, which may thus be considered as expressing the opinion of

the Netherland Entomological Society. Moreover, it is resolved to give to the report the widest publicity, by forwarding it to the different Foreign Societies which occupy themselves with Entomology.

The Netherland Entomological Society hopes that the subject will form a point of deliberation in all these Societies, in order that a mutual exchange of opinions about the matter may bring the necessary unity in nomenclature. The Society, moreover, thinks that a fit opportunity for this exchange of opinions will perhaps offer, if the matter could be brought under discussion at the Zoological Congress, which will be held this summer in Paris.

The Netherland Entomological Society,

Dr. A. W. M. VAN HASSELT, *President*.

Hague: *March*, 1889.

F. M. VAN DER WULP, *Secretary*.

[The above is a reprint of a circular issued by the Dutch Entomological Society. The controversy is old and is still "burning." In this particular case it concerns generic (more than specific) Nomenclature, and has mainly been induced by certain Coleopterists who have views of their own.

The rules of Nomenclature in Entomology can only be on a parallel with those in Zoology (and we might say Botany) in general.

These rules are tolerably understood, and amount to a recognition (as this circular admits) of the right of priority. But in the older time both "genera" and "species" were often little more than vague collective terms, and to a lesser extent they often still remain so.

The difficulty as to the "type" of an old "genus" must of necessity remain open to discussion. When Linné promulgated his binary system he never dreamed that we, in 1889, would be squabbling over what he and his early followers intended, or, rather, what they never anticipated would be disputed, from want of that knowledge we now possess.

Our sympathies are in accord with the terms of the propositions. But no one can control individual opinion. It is not necessary that a suggested change in Nomenclature should be *accepted*: quite the contrary. The *servile* acceptance of a change only proves that the acceptor has not studied for himself the reasons (if any) given for the change.

Those who object should be armed as to their reasons for objection. It is one of those cases in which we think "custom" should predominate.—EDITORS.]

SOUNDS PRODUCED BY BUTTERFLIES OF THE GENUS *VANESSA*.

BY H. T. STANTON, F.R.S.

Since the publication of my note on this subject (see *ante* p. 225) I have received the three following notices, which further elucidate the point in question.

Mountsfield, Lewisham:
April 10th, 1889.

With reference to your note on *Vanessa* sounds, I thought it might interest you to know that I have noticed that both *Vanessa Io* and *V. urticæ* produce the same sound by the friction of the costa of the hind-wing on the upper wing. I noticed it in both species when I was making drawings of them. As soon as their wings had become dry after emerging from the pupæ, upon any slight disturbance they suddenly spread their wings and thus produced the sound. I have little doubt but that the other *Vanessidæ* make the same sounds.—
F. W. FROHAWK.

9, Dornton Road, Balham, S.W. :

March 4th, 1889.

Last year I bred some two dozen *Vanessa polychloros*, and the sound you describe was most distinct, but I took no particular notice at the time, concluding it was caused solely by the motion of the wings rubbing either one against the other at the base, or more likely by that part of the hind-wing which forms a reception for the abdomen, the texture of which (if I may use the term) is of a tougher nature than the rest of the wing, and is peculiarly so in this species. I should liken the sound in a faint way to the rustling of silk.—
N. P. FENWICK.

Holmwood, Surbiton Hill :

February 28th, 1889.

Until I read your article on the sounds produced by *Vanessa*, I supposed that the fact of a sound being produced by the species of this genus was well known. Only this winter a *Vanessa Io* was brought to me, and I let it loose in my conservatory. It was, however, sluggish, and I could not get it to fly about as I desired ; I therefore kept touching it with a pencil, each time it opened and shut its wings and produced the usual sound. So far as I could judge (examining it closely) the sound is produced (in the act of opening the wings) by the rubbing of the costal and subcostal veins of the hind-wings over the median and submedian veins of the fore-wings ; the sound can be produced by doubling a piece of writing paper and rubbing the two sides of it together between the finger and thumb—it is neither grating nor squeaking.—A. G. BUTLER.

British Museum (Natural History),

Cromwell Road, London, S.W. :

February 28th, 1889.

THE SPREADING OF *ORTHEZIA INSIGNIS* IN ENGLAND.

BY J. W. DOUGLAS, F.E.S.

In this Magazine, vol. xxiv, p. 169, I described and figured both sexes of this curious and elegant Coccid from specimens found in the Economic House in the Royal Gardens, Kew, by Mr. E. T. Browne, in August, 1887. It was first seen there on plants of a species of *Strobilanthes* from China, but it afterwards appeared on other foreign plants. There was no information of any injury it had done to them.

In January, 1888, I received from Mr. J. Irwin Lynch, Curator of the Botanic Gardens at Cambridge, several specimens of the female which had been taken from a plant of *Eranthemum nervosum*, which, like *Strobilanthes*, belongs to the Natural Order *Acanthaceæ*. It was somewhat numerous, and Mr. Lynch informed me that he had seen the insects on other *Acanthaceæ*, but not on plants of any other Order. The insects, he says, no doubt came to Cambridge from Kew, but not on *Eranthemum*, and he adds that "it does about as much harm as the mealy bug."

Now, I have just received some examples of the female from a garden at Norwich, where it is reported they are breeding rapidly, and doing considerable damage to plants of *Coleus* (*Labiatae*). There can be no doubt that these insects, most probably in the egg-state and unobserved, are conveyed with plants from place to place, and the advent in other quarters of this "Heathen Chineë" may be expected, but not made known soon, for plant cultivators are usually reticent about the acquisition or possession of such creatures.

Thus this race of white-coated invaders of England, though at first but a small detachment of involuntary migrants from the Celestial Empire, makes progress through the land, *vires acquirit eundo*, like other previous settlers accommodating itself to the food and circumstances it meets with, and prospering and multiplying, so that it may be with the progeny

"Better fifty years of Europe than a cycle of Cathay."

No doubt gardeners will do their best to destroy these insects, but they will probably not entirely succeed, for, like other Coccids, they are so prolific, that ova at least will survive, and the females produced from them will again decorate the plants with their delicate confection-like forms; moreover, if not horticulturally favoured, they will be artificially protected creatures, defended from the English climate (or "weather," as it was termed by the American who said we had no *climate*), as well as from the parasites and other enemies that would have afflicted them in their native country.

8, Beaufort Gardens, Lewisham :

February 8th, 1889.

NOTES ON TWO *CAPSIDÆ* ATTACKING THE CINCHONA PLANTATIONS IN SIKKIM:

BY E. BERGROTH, M.D., F.E.S.

Mr. E. T. Atkinson, of Calcutta, has forwarded to me for identification a number of specimens of a Capsid, stated to have been noxious to the Cinchona plantations in Sikkim. The insect is described by Walker from a mutilated Malaccan specimen in the British Museum under the name of *Monalonion humerale*. It does not belong, however, to the American genus *Monalonion*, H.-S., but to the genus *Disphinctus*, Stål, four species of which are described from the Philippine Islands. There can be no doubt that *Monalonion politum* from Borneo and *divisum* from Ternate, both described by Walker, also belong to the same genus. *Disphinctus humeralis*, Walk., chiefly attacks *Cinchona calisaya*, but also a hybrid between *C. succirubra* and *officinalis*. I think Mr. Atkinson will publish a more complete account of the insect and its habitat.

Among the *Disphinctus* there was also a fine new species of the remarkable genus *Helopeltis*, Sign. (*Aspicelus*, Costa), of which I give the following description:—

HELOPELTIS FEBRICULOSA, n. sp.

Nigro et flavido-varia, oblonga, nitida, hemelytris subcinereis, cornu scutellari subrecto. Long., ♀, sine hemelytr., 5 mm., cum hemelytr., fere 8 mm.

Patria, Sikkim; habitat in *Cinchona calisaya*, rarissime in *C. succirubra*.

Caput nigrum, vitta laterali longitudinali sub oculis percurrente lutea notatum; antennarum articulo primo apicem scutelli paullo superante, sordide piceo, nigro-irrorato, basi luteo, apice incrassato, articulo secundo primo fere dimidio longiore, lineari, nigro, apice levissime subcapitulatim incrassato; rostro coxas posticas fere superante, luteo, hic et illic picescente, præsertim apicem versus parce tenuiter piloso, articulo secundo primo paullo longiore, tertio secundo brevior, quarto tertio evidenter longiore. Thorax superne luteo-flavus, fascia transversa basali in medio antrorsum magis extensa ac vitta transversa paullo ante apicem sita nigris signatus. Scutellum nigrum, utrinque ad basin cornus macula lutescente notatum, cornu longitudine thoracem æquante, erecto, tantum levissime rursum redunco, nigro, subcapitulum picescente, hoc apice horizontaliter truncato. Femora nodulosa, piceo-lutea, nigro-conspersa, anticis prope basin annulo pallide flavido notatis; tibiæ breviter subhispide pilosellæ, luteæ, nigro-adspersæ; tarsi nigri. Abdomen parte basali subvirescenti-albidum, parte apicali nigrum, colore pallido in ventre a basi usque ad apicem segmenti penultimi ventralis extenso, segmento ultimo ventrali et segmentis genitalibus itaque nigris; in dorso abdominis color niger præcipue in medio segmen-

torum basin versus magis extenditur. Hemelytra, basi flavo-albida excepta, cinereo-hyalinæ, nervis et cuneo angusto piceis. Alæ cinerascens.

This species is allied to *H. theivora*, Wat., but at once distinguished by the erect, very little curved scutellar horn; in the female of *theivora* it is strongly curved. Mr. Waterhouse says that the colour of *theivora* is black, without mentioning anything more on the abdomen. But, judging from the figure, it seems possible that the abdomen has nearly the same colour as in *febriculosa*.

The genus *Helopeltis* is much in need of a revision, most of the species being very imperfectly characterized. The figures of the scutellar horns in Mr. Waterhouse's paper are useful, but the explanation of the plate is not identical with the references given in the text, and the coloured figures do not at all correspond with the descriptions. In almost all specimens of *Helopeltis* which have reached European collections, the fourth antennal joint seems to have been broken off. From Prof. Costa's figure of *H. podagrica* it is evident, however, that the fourth joint is very long, so that the antennæ have nearly thrice the length of the body.

As the Indian readers of this Journal may often meet with species of *Helopeltis*, and as these insects are of a certain economic interest, I think it will be of use to publish here a list, with references, of the hitherto described species. The following is a chronological list. For information about the general habits of the tea bugs I refer to the work of Mr. J. Wood-Mason.*

- H. Antonii*, Sign., Ann. Soc. Ent. Fr., 1858, 502, pl. xii, fig. 2. Ceylon; on *Thea* and *Theobroma*.
- H. podagrica*, Costa, Ann. Mus. Zool. Napoli, II, 147, tab. ii, figs. 6 and 6a (1864). Locality and habitat unknown.
- H. pellucida*, Stål, Öfv. Vet. Akad. förh., XXVII, 667 (1870). Philippine Islands; habitat unknown.
- H. collaris*, Stål, *l. c.* Philippine Islands; habitat unknown.
- H. clavifera*, Walk., Cat. Hem.-Het. Brit. Mus., IV, 1871, 170 (*braconiformis*, Walk., *lib. cit.*, VI, 1873, 165). New Guinea; habitat unknown.
- H. nigra*, Walk., *lib. cit.*, VI, 1873, 165. Waigiou; habitat unknown.
- H. Bradyi*, Wat., Trans. Ent. Soc. Lond., 1886, 458, pl. xi, figs. 1, 2 and 2a. Java; on *Cinchona*.
- H. theivora*, Wat., *l. c.*, figs. 3 and 3a. Assam; on *Thea*.
- H. Romundei*, Wat., *l. c.*, 1888, 207. Java; on *Thea*.
- H. febriculosa*, Bergr., 1889. Sikkim; on *Cinchona*.

Forssa, Finland: *March*, 1889.

[By the kindness of the Editors of this Magazine, I am able to add the following remarks on the above.

* Report on the tea mite and the tea bug of Assam. London, 1884.

Specimens of *Monalonia humerale*, Walker, from Sikkim have been received at the British Museum from Mr. E. T. Atkinson, and with them one immature example of a *Helopeltis*. This *Helopeltis* I believed to be *H. theivora*, ♀, and it has the horn on the scutellum curved as in that species, and slightly emarginate at the apex (viewed laterally). So far as I can judge of the colour, it does not differ materially from *H. theivora*; the scutellar horn is brown, with a ring at the middle and a spot on each side of the base, yellow. If Dr. Bergroth had not stated that his example was a female, I should have taken it to be the male of this species, which would have the scutellar horn shorter and less curved.

According to Dr. Trimen, the specimens from Ceylon referred to in my paper as *H. Antonii* were from cacao and not from tea; my note, T. E. S., 1888, p. 207.

The unfortunate transposition of the reference numbers 4 and 5 in my paper is corrected in the "errata" (introd., p. viii); the references in the "explanation of the plate" are correct.—CHAS. O. WATERHOUSE: *March 18th*, 1889.]

ÆSCHNA BOREALIS, ZETT.

BY ROBERT McLACHLAN, F.R.S., &c.

This remains one of the least known among the European Dragonflies. Its distribution is entirely boreal or high alpine according to latitude. In this country I am not sure that it has been noticed since I took a few specimens at Rannoch in the beginning of June, 1865 (*cf.*, Ent. Mo. Mag., vol. ii, p. 117).

A few days ago my friend and colleague of our local (West Kent) Natural History Society, Mr. Hainworth, gave me a pair (♂ ♀) of *Æ. borealis* captured at Luleå, Sweden, near the head of the Gulf of Bothnia, by his relative, Mr. W. J. Rose, the civil engineer who has charge of the construction of the Railway between Luleå and the iron mines of Gellivara. In the course of my examination of these specimens, and of others from Scotland, I became aware of the existence of a character in the superior appendages of the ♂ that I do not find alluded to in any description. *Near the apex of the median carina of these appendages there are five or six teeth or crenulations*, somewhat after the style seen in *Æ. crenata*, but in this latter the teeth are larger and more distinct. Upon referring this matter to my friend Baron de Selys, he found precisely the same character in

the two ♂ in his collection, so it may be presumed to be usual. But there should be no risk of confusing *borealis* and *crenata*, which may possibly occur together in some high northern localities. Putting on one side the much smaller size of *borealis* (as compared with *crenata*), the eyes are connected in a shorter space than, probably, in any other true *Æschna*, in fact, just about to the same extent as is seen in *Brachytron pratense*; and this is a character that should especially be borne in mind by those entomologists who may capture *Æschnæ* in the Highlands of Scotland, and feel doubtful as to identification.

Formerly a character of great importance was supposed to exist in the neururation of *borealis*, viz., that the sub-nodal sector is not furcate. The real state of affairs appears to be that the upper branch of the furcation (when present) is perhaps never in the solid condition usual in *Æschna*, that it is often rudimentary, and that it is often absent in some of the four wings; but in all the specimens in my collection I do not find one in which there is not an indication (at least) of furcation, sometimes only on one side, sometimes in the anterior and not in the posterior. It is useful as a secondary character, that should be taken in conjunction with others.

It has been noted that in *borealis* the membranule is uniformly blackish. I believe this was the case with my Scotch specimens when fresh; but now, after 24 years, it should be termed uniformly dark cinereous, and the same may be said of the more recent specimens from other localities.

In none of my specimens are the intricate markings of the body now in a condition for a detailed description, and I think no accurate details have yet been published.

The condition of the eyes (fully pointed out by De Selys in the "Revue des Odonates," although he had then only seen one example), is the best *prima facie* character, and will readily separate *borealis* from *mixta*, *affinis*, or very small specimens of *juncea* or *crenata*, with which it might possibly be confounded.

I suppose I ought to consider myself fortunate in now possessing seven examples of *borealis*, viz., 2 ♂ 1 ♀ from Rannoch, Scotland; 1 ♂ 1 ♀ from Luleå, Sweden (above alluded to); and 2 ♀ from the Upper Engadine, one taken by myself, the other kindly given to me by my friend, Mr. F. F. Freeman, of Plymouth, by whom it was captured.

Lewisham, London:

April 2nd, 1889.

OBSERVATIONS ON COCCIDÆ (No. 4).

BY ALBERT C. F. MORGAN, F.L.S.

ANAL TUBERCLES.

The figures on the accompanying Pl. IV represent the general exterior appearance of the insects which I selected as types of the sub-families *Lecanina* and *Coccina*, when treating of the caudal appendages in my last paper, No. 3 (*ante* pp. 189—196). Fig 1 shows the ventral side and fig. 2 the dorsal side of *Dactylopius citri*, Boisd., adult female; but when re-drawing and engraving my figure, the artist has inadvertently figured the antennæ with seven joints instead of eight. The dots on the lateral margins of each segment in fig. 2 represent the position of the glands which secrete the mealy powder, so characteristic of the genus *Dactylopius*, or “white mealy bug.” Fig. 3 represents a sprig of *Oleander*, much populated with *Lecanium oleæ*, natural size, of which fig. 4 is the adult female and fig. 5 the larva.

Mr. Maskell, in his “Account of New Zealand Scale Insects,” introduces a new division or sub-family, which he has called “*Hemicoccidinæ*,” and which he “considers intermediate between the *Lecanidinæ* and the *Coccidinæ*.” He says (*l. c.* p. 87), “Larvæ presenting at the extremity of the abdomen two conspicuous protuberances, or ‘anal tubercles,’ as in the following group, *Coccidinæ*; abdominal lobes and cleft absent. Adult females exhibiting the abdominal cleft and lobes of *Lecanidinæ*.” He institutes this new sub-family in order to include the genus *Kermes*, but this is contrary to the opinion of Signoret, who states (Ess. s. l. Coch., p. 301), “Mais si on étudie ces mêmes espèces à l’état de larve, alors elles présentent les vrais caractères des Coccites; menton multiarticulé, et l’extrémité abdominale plus ou moins fendue et lobée sur les côtés, mais sans les squames caudales des Lécanides.”

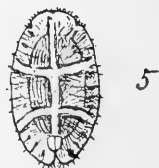
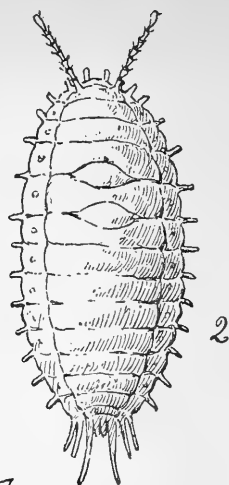
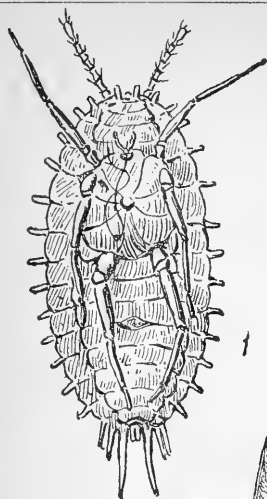
I have no personal experience of the genus *Kermes*, and I observe, that although Mr. Maskell proposes to include in his new sub-family several genera which Signoret includes in the *Lecanina* (*e. g.*, *Pollinia*, *Asterolecanium*, &c., &c.), he mentions (*l. c.*), “that none of the insects belonging to this group have as yet been reported as occurring in New Zealand.”

I cannot, of course, express a definite opinion as to the desirability of establishing another sub-family without examining the genera proposed to be included; but, from Dr. Signoret’s figures and descriptions (*op. cit.*, Pl. xiv and p. 347), I do not see any reason why the genus

Kermes should not be included in the *Coccina*, provided that the *adult* female does not possess the anal plates, and I must admit that my own observations lead me to think that Mr. Maskell's reasons for the establishment of a new group are insufficient.

The fact of the larvæ having what are termed "anal tubercles," such as are seen in the adult of the *Coccina*, whilst the adults of the same species have anal plates and cleft such as are peculiar to the *Lecanina*, does not, I think, warrant a separate division. For I find, on examination, that the larvæ of the *Lecanina*, for example, *Pulvinaria vitis* or *Lecanium oleæ*, are furnished with these "anal tubercles," but they seem at an early stage to be superseded by the "anal plates," which I should suppose are the same processes as the former, although, in a more advanced (or retrogressive) stage, in fact, I apprehend that they really form the last dorsal segment. If these "anal tubercles" have not before been observed in the larvæ of the true *Lecanina*, I think it can only be that the insects have not been examined when sufficiently young. In the larvæ of *Diaspina* similar tubercles will be found, but the two long hairs or anal setæ are situated not at the termination of the tubercles, as in the *Coccina* and *Lecanina*, but apparently on the margin between the tubercles. These latter are superposed dorsally, just as in the larvæ of *Lecanina*, and I apprehend form afterwards the median lobes so characteristic of the *Diaspina*, and which are, I think, always dorsal, the limits of the ventral margin being seen underneath in transparent specimens, as may be noticed in many of Comstock's figures. In the *Coccina*, at least in the genus *Dactylopius* and others, these "anal tubercles" do not seem to undergo much modification. Comparative figures of the terminal segments of the larvæ of many different genera from the different divisions and sub-families would, I think, show a considerable uniformity of structure, and could not fail to be instructive; but it appears to me that for the purposes of entomological division of the family we must depend upon the characters of the *adult* in all cases, and to justify the institution of a fourth group, I cannot help thinking that it would be necessary to find some genera in which the *adult* female, while provided with the multi-articulate labium of the *Coccina*, is furnished with the anal plates of the *Lecanina*.

I may mention that it is quite possible that I am not correct in my determination of the species figured, which were studied with a view to the structure of the caudal segments as before mentioned, and as Signoret describes such a large number of these two genera (*Lecanium* and *Dactylopius*), it is not difficult to be mistaken, until I



have had further opportunities of studying more species of each genus, in order to fully appreciate on what differences of characters the various species are based.

EXPLANATION OF PLATE IV.

- Fig. 1.—*Dactylopius citri*, Boisd., ♀, ventral view.
 „ 2.— Ditto ditto ♀, dorsal view.
 „ 3.—Sprig of *Oleander*, populated with *Lecanium oleæ* (natural size).
 „ 4.—*Lecanium oleæ*, Bern., ♀, adult.
 „ 5.— Ditto ditto ♀, early stage.

N.B.—With the exception of fig. 3, the above are all magnified about 11 diameters.

My original figures were drawn with an exact magnification of 11 diameters, but, on being re-drawn, the artist slightly increased the size of the figures.

Villa Nova de Gaya, Portugal :

February 17th, 1889.

Enquiry for scales of Coccids on oaks.—There are on the continent of Europe several species of *Coccidæ* (*Lecanium*) living on the common oak that very probably exist also in Britain, though hitherto unnoticed. These scales are brown in colour, of the size of a large pea, globose, subcordate or flattened-oval in form ; some also having a pad of cottony matter beneath and behind them (*Pulvinaria*). They project from the bark to which they are attached, and will be found, as a rule, near the termination of last year's shoots among the buds, or in the axils of the small lateral shoots and old leaves. I should feel greatly obliged if searchers for *Cynips*-galls, or other persons who, by chance, may meet with such excrescences will send them to me, attached to the wood as they find them ; packed in a box or otherwise protected from injury. I will gladly repay the postage. "I wonder if it is of any use to make this request?" said I to a friend. "Try," said he. So, like Micawber, "I am waiting for something to turn up." If they should come in June (though that would be rather late for the examination of the insect inside) they would not be objected to, and they need not be limited in quantity.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham : April 8th, 1889.

Enquiry for Diaspis visci inhabiting mistletoe.—In his "Enumeratio Insectorum Austriae," p. 296 (1781), Schrank described the ♀ of *Coccus visci*, obtained from leaves of mistletoe (*Viscum album*), which fell to the ground when shaken from the plant. The scales (white with a yellow centre) were orbicular, and scarcely half a line in diameter. In the "Verhandl. zool.-botan. Gesells. Wien," xii, 110, Dr. Franz Löw referred this to the genus *Aspidiotus*, and in the same work xxii, 273 (1872), he re-described it as *Diaspis visci*, the scale of the ♂ being of an elongate, unicarinate form, with figures on tab. iv. The object of the present note is to say that I shall be greatly obliged to any one who has access to mistletoe, if he will kindly send to me any such scales that he can find, for I have no doubt that the species occurs in this country.—ID. : April 16th, 1889.

THE BRITISH SPECIES OF *SCOLOPOSTETHUS*.

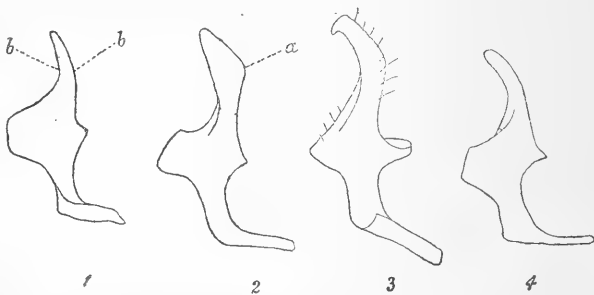
BY JAMES EDWARDS, F.E.S.

I have recently taken occasion to examine our British species of this genus, and as my resulting views do not accord with those expressed by Mr. Saunders, at p. 148 *ante*, I desire to record them here.

The material upon which I have worked includes a number of specimens collected by Mr. Saunders in various localities, as well as a quantity taken in this district by Mr. Thouless and myself.

These insects have a great similarity of appearance, and are undoubtedly very closely allied; but, after a very careful study of them in quantity, I think that we have six distinct species. I express this opinion with the less hesitation, because I find that the suggestion of distinctness which may be derived from the differences in the colour of the antennæ, and the presence or absence of certain processes of the mesosternum, is borne out by certain structural differences in the male genitalia. I give a figure of the male genital style in all the species I have been able to dissect. The differences in the contour of these organs are readily appreciable on examination with a Coddington or similar lens, but with the compound microscope and a one-third objective the following additional peculiarities of structure may be observed; in *S.*

affinis (fig. 3) the long hairs on the terminal lobe are seen to spring from large tubercles, such as one finds on the antenna of a *Libur-*



nia; in *S. neglectus* (fig. 2) there exists at the point marked *a* a group of converging spines; in *S. punctatus* (fig. 4) the surface of the terminal lobe is apparently perfectly simple; and in *S. decoratus* (fig. 1) there is an adpressed spine on each side of the terminal lobe at the points marked *b*. For the purposes of classification, however, it is by no means necessary to resort to the characters afforded by the male genitalia, as will be seen from the following table, which sets forth the main characteristics by which our insects of this genus may be separated.

1 (2) Antennæ slender, entirely yellow, mesosternum simple in both sexes...

1. *pictus*, Schill.

- 2 (1) 3rd and 4th joints of antennæ black.
- 3 (6) 1st and 2nd joints of antennæ entirely yellow.
- 4 (5) Mesosternum in the ♂ with two long curved horns in front, in the ♀ with a pair of small tubercles. Membrane generally incomplete...
2. *affinis*, Schill.
podagricus, Thoms.
- 5 (4) Mesosternum simple in both sexes. Membrane generally complete...
3. *adjunctus*, D. & S.
decoratus, Thoms.
Thomsoni, Reut.
- 6 (3) 1st and 2nd joints of antennæ not entirely yellow.
- 7 (8, 9) 1st and 2nd joints of antennæ yellow, the former black at the base (at least on the under-side), the latter with a well-defined black ring at the apex. Prosternum in front with a shallow diffuse punctuation. Mesosternum simple in both sexes. Membrane generally incomplete...
4. *neglectus*, n. s.
affinis, Leth. p.
- 8 (7, 9) 1st joint of antennæ yellow-red, frequently suffused with brown, 2nd joint black or blackish, its basal third or half yellow-red, the limits of each colour not sharply defined. Prosternum in front closely and deeply punctured. Mesosternum in the ♂ with two long curved horns in front, in the ♀ with a pair of small tubercles. Development of the membrane various.....5. *punctatus*, n. s.
affinis, Leth. p.
- 9 (8, 7) Antennæ black, the 2nd joint very narrowly yellow at the base. Mesosternum simple in both sexes. Membrane always complete...
6. *decoratus*, Hahn.
ericetorum, Leth.

In the matter of nomenclature I have followed the 3rd edition of Dr. Puton's Catalogue.

No. 1 is a rare species, and its specific distinctness seems to be regarded as less questionable than that of the others. Examples of No. 2 sometimes occur in which the 3rd and 4th joints of the antennæ are yellow-brown instead of black, and these have been mistaken for *pictus*, from which they may be separated by the presence of the mesosternal horns; such examples, however, which are possibly the result of immaturity, are not of sufficiently common occurrence to invalidate the antennal characters laid down in the foregoing table. A similar colour variety of No. 3 would present greater difficulty, but I think that the exceptionally slender *unicolorous* antennæ of the true *pictus* would serve to distinguish it.

No. 2 is common by general sweeping. I have seen but one specimen with the membrane complete, this is a female in coll. Saunders.

No. 3 I introduce on the strength of Mr. Douglas' statement

(Ent. Mo. Mag., xi, p. 265) that Thomson's *podagricus* and *decoratus* were both comprehended as one species under the name *adjunctus*, D. & S. Neither Mr. Saunders nor I have seen any British example possessing the characters given above for *decoratus*, Thoms., although it is apparently well known on the continent.

Nos. 4 and 5 seem to have been included by M. Lethierry in his description of *S. affinis* (Cat. Hem. Nord., ed. ii, pp. 19 & 20); in any case it is remarkable that his insect of that name is not recognised by Dr. Puton, either in his account of the genus in his Syn. Hem.-Het. France, or in the last edition of his Catalogue. No. 4 is occasionally met with in some numbers in this district, while No. 5 I only know from Mr. Saunders' collection.

No. 6 is very common, but I have not met with it except on or near heath, nor have I seen a specimen with the membrane abbreviated.

With the exception of the species last named, I have not paid sufficient attention to these insects in the field to enable me to form any opinion as to the value of habitat as an aid to the separation of the species. As in many Lygæids the relative length of the joints of the antennæ is very liable to vary, but in the larger proportion of specimens it will be found that in No. 4 the fourth joint is very distinctly longer than the third, while in No. 5 the fourth joint is either subequal to or distinctly shorter than the third.

131, Rupert Street, Norwich:
February 25th, 1889.

Notes on Diptera in 1888.—Many of the captures here recorded have been made by correspondents, but, in all cases, the specimens have been sent me for identification. The weather has been so exceptionally unfavourable, and my time for collecting so very limited, that these notes are far less numerous than I had hoped to make them.

Cecidomyidæ.—On October 26th I took fourteen specimens of a species of this family on the window of my house in London. I do not know the species, but it is not *C. destructor*, Say, which, though it should be abundant enough, judging from the damage done by it to the wheat crops in Europe, seems singularly rare in collections, as over twenty correspondents of mine in England and on the continent have failed to get me a single specimen.

Dilophus febrilis, L.—A correspondent at Highgate bred some from *Calceolaria*, the larvæ living on the roots of the plant, causing its death. He also bred a species of *Sciara* from the same plant, the larva eating its way up the stem.

Psychoda phalanoides, L.—This has been very common in London this year, and I have taken two specimens of the less common *P. sexpunctata*, Curt.

Xiphura nigricornis, Mg.—One was sent me from Painswick, Gloucestershire.

Stratiomyia longicornis, Scop.—Three from Colchester.

Tabanus tropicus, Mg.—One from Aberdeen, which seems a very northerly locality for species of this genus.

Atylotus fulvus, Mg.—One from Colchester.

Eutolmus rufibarbis, Mg.—Mr. Pocock, of the British Museum, showed me five specimens from Pembrokeshire that appear to be this rather uncommon species, but as they had been moistened with some liquid, it was impossible to determine them with certainty. One specimen undoubtedly of this species was sent me from Lincolnshire.

Laphria flava, L.—A rare and very handsome, large species. Two from Kincardineshire, taken during the first week in September, on birch or heather. These are the first British specimens I have seen.

Bombylius discolor, Mik.—One from Colchester. The *Bombylidæ* have been rare this summer; they are essentially a warm weather group.

Thereva nobiletata, F.—A single specimen from Aberdeen. All the *Therevidæ* are uncommon.

Syrphus arcuatus, Fall.—I took one of this uncommon species whilst visiting a friend at Hastings last August. *S. pyrastris*, L.—A nearly black variety was kindly given me by a correspondent at Painswick, where it was taken.

Pyrophæna ocymi, F.—Mr. Walker showed me one that he took this summer, but I forgot from what locality it came.

Helophilus lunulatus, Mg.—Two from Ventnor, Isle of Wight.

Criorhina ruficauda, De Geer.—One specimen of this rare species was sent me for identification by Mr. Watkins, of Painswick, taken on French lily in May.

Conopidæ.—I am especially interested in this group, being engaged in revising the European species. Five species have been sent me from Colchester and two from Aberdeen. I have also received two specimens that appear to be *Myopa polystigma*, Rond., a species new to Britain; they were taken at Painswick in an orchard. Some authorities consider *polystigma* only a variety of *testacea*, L.

Gastrophilus equi.—All the *Æstridæ* are rare, and their flight being exceedingly swift, makes it still more difficult to obtain specimens. As they are all parasitic on animals, and die if removed from their host, it is impossible to breed them. A correspondent sent me three *G. equi* (from Painswick) which is the only species I have seen this year.

Cynomyia mortuorum.—One from Aberdeen (taken in August) was sent me to name, this being the first British example I have seen, though the species has figured on our lists for some years.

Dasyphora lasiophthalma.—Two were sent me from Tenbury. It is not a common species. *D. cyanella*.—Rather rare; a pair from Rigsby, Lincolnshire.

Graphomyia picta, Zett.—The first specimen of this species (a ♀) that I have been able to keep was kindly given to me by a correspondent, who took it in Lincolnshire. The only other specimens that I have seen are in Mr. Verrall's collection. The other species, *G. maculata*, is not uncommon, especially on the South Coast.

Calliphora vomitoria.—This species is far from common in and around London, though many think it is the common meat fly (*C. erythrocephala*). During the past summer I have taken over three hundred of the latter, in hopes of getting *vomitoria*, but only got one specimen. I took another at Epping Forest. It is very widely distributed, and may be easily recognised by its red beard, which, in *erythrocephala*, is always black.

Phora rufipes.—This little fly is found everywhere, and appears to feed on everything, both animal and vegetable. A correspondent sent me some from Chester, where he had bred several from a beetle (*Rhizotrogus solstitialis*).

I have taken a number of Acalypterate *Muscidæ* at Epping Forest, Wimbledon, and Coombe Wood (the only three places I have collected at this year, with the exception of a day at Hastings), but have not yet had time to examine them.

Lepidopterists could greatly assist those working at the *Diptera* by pinning the parasites on moths. They are chiefly *Tachinidæ*, and this is a group that is far from well known.

The absence of typical collections from most of the local Museums is a great drawback to the student, but it is to be hoped that before long this obstacle will be removed. I shall be most happy to assist any one working at this Order, and shall be pleased to examine small collections, as the distribution of the species is of interest to me.—E. BRUNETTI, 129, Grosvenor Park, Camberwell, S.E. : *March*, 1889.

A parasite on Forficula.—On crushing an earwig in the summer, I was surprised to see a larva of some kind issue from the body. It was a fleshy, apodal grub, of a yellowish-white colour, with two intensely black prominences at the posterior extremity of the body, in the shape of truncated cones. A small black object was also visible near the anterior extremity, but ill-defined, in consequence of lying at a lower level than the fleshy folds of the body round it. This I take to be mouth organs of some sort. I do not remember to have seen any record of internal parasites of earwigs, and therefore send this notice, in the hope that some entomologist who has studied such parasites may be able to throw some light on its nature.—E. A. BUTLER, Ashley Road, Crouch Hill, N. : *April*, 1889.

[We find the following references to insect-parasites in *Forficula*. In Westwood's "Introduction," i, p. 404, it is stated, "These insects are subject to parasites; Mr. Davis having informed me that *F. auricularia* is attacked by one of the *Ichnemonidæ*." In Fischer's "Orthoptera Europæa," p. 45, we read, "Boheman e *Forficula auricularia*, cujus abdomen inconvicinis modo tumidum erat, inter thoracem et abdomen pupam magnam ovalem fuscam insecti Dipteri protrudi observavit, e qua mense majo *Tachina setipennis* exclusa est." Mr. Butler forwarded a sketch of his larva, which may possibly be that of a *Tachina*. We shall be glad for any more precise or recent information on parasites on earwigs.—EDS.]

Apanteles hoplites, Rtzb., in *Britain*.—A female of this parasite was bred by Mr. W. H. B. Fletcher from the larvæ of *Gelechia populælla* in 1885. I had overlooked it, and mixed it up with some *Microgaster tibialis* bred from the same host at the same time; it is a very distinct species, and easy to be recognised. Its place in the Rev. T. A. Marshall's Monograph of the British *Braconidæ* (Trans. Ent. Soc., 1885) is next to 30. *A. fulcatus*, Ns., and in the table p. 160 is as follows:

(11) 10 Squamulæ testaceous.

* Stigma entirely dark; aculeus of female shorter than the abdomen ..
fulcatus, Nees.

** Stigma pale at the base; aculeus of female as long as the abdomen ..
hoplites, Rtzb.

It is interesting to note that Ratzeburg bred the species from the same host.—JOHN B. BRIDGMAN, Norwich : *April*, 1889.

Tinodes maculicornis at *Athlone*.—At page 136, vol. xxiv, Ent. Mo. Mag., Mr. K. J. Morton records the occurrence of *Tinodes maculicornis*, Pict., from the north of Ireland, at Glaslough. I have now to record it from the neighbourhood of Athlone, where it seems to occur in considerable numbers, judging from the specimens which I brought home, seeing that I did not recognise it at the time, and hence did not take as many as I would otherwise have done. It seems to occur all along Lough Ree, Twy River, and at Glasson.—JAMES J. F. X. KING, 207, Sauchiehall Street, Glasgow: *March*, 1889.

Nyssia zonaria in *Co. Antrim*.—I beg to inform you that on the 29th of March last I captured at Ballycastle, Co. Antrim, four male and one female specimens of *Nyssia zonaria* in good condition. This is, I believe, the first recorded capture of this moth in the imago state in Ireland. And as the insect is found only in a few isolated localities, the information may prove interesting to your readers.—JOHN BRISTOW, St. James' Parsonage, Belfast: *April 3rd*, 1889.

Food-plant of Hesperia Actæon in England.—In the Ent. Mo. Mag., vol. x, p. 86, the late Mr. Wm. Buckler described the food-plant of the larva of *H. Actæon* as *Brachypodium sylvaticum*, and as I find this statement is not corrected in "Buckler's larvæ," published by the Ray Society, it may be well to publish Mr. W. Buckler's own correction of this error. The following is an extract from a letter received by myself from Mr. Buckler, dated Emsworth, June 7th, 1880: "I am indeed greatly rejoiced to see the larvæ of *H. Actæon* in all stages of growth that you have so kindly sent me, and particularly at the blossom of the grass they feed on, for now I can be sure it is that of *Brachypodium pinnatum*, and not *sylvaticum*." I may add that *Brachypodium sylvaticum*, so far as I am aware, does not grow in the localities frequented by *H. Actæon*, while *pinnatum* is abundant.—C. R. DIGBY, Studland Rectory, Wareham: *April 1st*, 1889.

Prices of British Lepidoptera.—The following notes regarding the late Mr. A. F. Sheppard's Collection, sold by Auction at Stevens' Rooms, on the 25th and 26th March, may be interesting to some of our readers. The Collection was estimated at about 27,000 specimens, and for sale purposes formed about 430 Lots. The sum realized for the whole (exclusive of the Cabinets) was nearly £400. More than £100 was secured for the Butterflies alone. We make a brief analysis of some of the principal features. Two examples of *Vanessa Antiopa* were sold for 28/-; thirty *Lycæna dispar* realized £55 (two pairs, ♂ ♀, of this insect, in extra fine condition, were sold at £6 per pair); a lot, in which *Polyommatus bætica* was included, fetched £4; four lots, in which *P. Acis* was included, fetched nearly £7; two lots, consisting of four *Deilephila livornica* and two *D. celerio*, were sold for nearly £3; lots, consisting chiefly of varieties of *Arctia Caja* and *villica*, fetched over £13; two examples of *Deiopeia pulchella* realized 30/-; twenty-two specimens of *Lalia cænosa* realized £10; a series of about forty *Abraxas grossulariata*, including many vars., was sold for £5 10s., and twelve specimens of *Lobophora polygrammata* for 4 guineas; a lot, in which the only remarkable feature was *Noto-donta bicolora*, was knocked down at £3; and another lot, which included *Bryophila*

algæ, at £1. The *Leucaniæ* and *Nonagriæ* fetched long prices. Eighteen specimens of *Noctua subrosea* were sold for £20, as much as £3 5s. being paid for a pair; both this and *Lycæna dispar* are no doubt extinct, for although both occur on the continent, so far as the species is concerned, the British form no longer exists. Good prices were also obtained for the *Micro-Lepidoptera*; but it was evident that, from a collector's point of view, the value was regulated by size and rarity combined. A few *Tortrices* and *Tineina* certainly fetched high prices, probably not because they are actually rare, but because the "art" of collecting or breeding them has died out with the "experts" who formerly used to obtain them in numbers.—EDS.

Orrhodia rubiginea at Seaton.—On the 24th March last, I was fortunate enough to obtain a fine specimen of *Orrhodia rubiginea* at sugar. I have also taken several specimens of *Xylina socia*.—JOHN H. STILL, Seaton, Devon: April 10th, 1889.

Notes on the probable origin of last year's Deilephila galii.—I have lately been much interested in obtaining information as to the relative sizes of the caught imagines and bred examples of *D. galii*, and venture to think they may throw considerable light on their probable origin, and help to strengthen the so-called "*blown over theory*."

Any one looking at a series of continental *galii* cannot fail to see how much larger and robust looking they are when compared with those bred from English fed larvæ, and they too will see, by what follows, that in nearly every case of a caught specimen of the moth during the months of July and August of 1888, they also measure considerably more than any specimen bred from the numerous larvæ found in September, 1888.

Continental *D. galii*—the females measure from 3 to 3½ inches; males, 3 to 3½ inches.

18 specimens caught by Mr. J. T. Williams and Mr. F. Oswald at St. Margaret Bay in July and August, 1888: females, 3½ to 3¾ inches; males, 3 inches (one measured more than 3½ inches).

1	„	„	Mr. Sheldon at Kingsdown, female, 3 inches full.
1	„	„	Mr. Youens at Dartford, male, 3 inches full.
1	„	„	Mr. W. Thompson at Stoney Stratford, female, 3 inches full.
1	„	„	Mr. A. Horne at Aberdeen, female, 3¼ inches.
1	„	„	Mr. Hart at Dublin, male, 2 $\frac{7}{10}$ inches.
1	„	„	Mr. P. Kirk at Dundee, male, 2 $\frac{5}{8}$ inches.

Thus all, save the two males from Dublin and Dundee, are 3 inches up to 3¾ inches. But out of a large number of bred specimens from English larvæ, very few indeed reached 3 inches, and I can only find two females that exceed 3 inches.

Bred by Mr. Capper and Liverpool collectors, one female, 3 inches 2 lines, the average ♀, 2½ inches; the largest ♂, 2 inches 10 lines, average ♂, 2 inches 6 lines.

96 specimens bred by W. H. T. from Deal, one ♀ reached 3 inches 1 line, average ♀, 2½ inches.

18 „ „ Mr. John A. Cooper from Essex, ♀, 2½ inches, ♂, 2¾ inches.

These figures give an average of at least three-eighths of an inch larger in the

caught specimens over the bred, and the sizes of the caught accord in every way with continental examples ; this, to my mind, makes it strongly suggestive of the caught insects being immigrants, and materially strengthens the "*blown over theory*."

It may be argued that bred insects are often undersized ; but, in my own case, *very many* larvæ were absolutely full fed when found, and all fed under the most favourable conditions, and could not be dwarfed from breeding. Forcing pupæ in no way affects size, although, in some cases, when forced much, the ova are not fully developed, as in *Acherontia Atropos*, but then the moths are of full expanse of wing.—W. H. TUGWELL, 6, Lewisham Road, Greenwich : *April 2nd*, 1889.

Additions to the list of Irish Coleoptera.—The following species do not appear to have been hitherto recorded as occurring in Ireland. *Bradycellus similis*, Armagh and Carlingford. *Hydroporus lituratus*, F. (*xanthopus*, Steph.), Armagh ; I have taken several specimens since my former note (Ent. Mo. Mag., xxiv, 17) erasing it from the Armagh list. *Anacæna globulus*, Payk. (*limbata*, Sharp), Armagh. *Chætarthria seminulum*, Armagh, Derryadd shore, Lough Neagh. *Aleochara cuniculorum*, Armagh. *Oxytela longiuscula*, Armagh. *Homalota gregaria*, *H. vicina*, *H. pagana*, *H. graminicola*, *H. atramentaria*, and *H. fungi*, all at Armagh. *Megacronus analis*, Armagh. *Heterothops binotata*, Armagh. *Quedius cinctus* and *Q. molochinus*, Armagh. *Ocytus morio*, Portrush Sandhills, Co. Antrim. *Philonthus ventralis*, *Ph. micans*, and *Ph. trossulus*, Armagh. *Lathrobium rufipenne*, Carlingford. *Evæsthetus scaber* ; I am not absolutely certain as to the identity of this insect, but it appears to agree with Canon Fowler's description ; I have taken a good many in wet moss in the Mullinures. *Stenus atratulus*, *S. fuscicornis*, *S. canescens*, Rosh. (*major*, Rey), *S. cicindeloides*, and *S. latifrons*, Armagh. *Platystethus nodifrons*, Armagh. *Oxytelus insecatus*, Armagh ; *O. inustus*, Armagh and Carlingford ; *O. complanatus*, Armagh. *Haploderus cælatus*, Armagh and Carlingford. *Trogophleus elongatulus*, *T. corticinus*, and *T. tenellus*, Armagh. *Hapalarea pygmæa*, Cranmore, near Belfast, taken by Mr. R. Templeton, and now in the collection of the Belfast Natural History and Philosophical Society. *Anthobium minutum*, Armagh. *Megarthus depressus*, Armagh. *Silpha obscura*, near Belfast, taken by Mr. R. Templeton and Rev. J. Bristow. *Choleva spadicea* and *C. Wilkini*, Armagh. *Scydmaenus collaris*, Armagh. *Eumicrus tarsatus*, Armagh. *Adalia obliterata*, Armagh. *Hister neglectus*, Mourne Mountains, taken by Mr. R. Templeton, and Armagh. *Saprinus nitidicollis*, Portrush sandhills. *Brachypterus pubescens*, Carlingford ; *B. urticæ*, Carlingford and Armagh. *Cercus rufilabris*, Armagh.

Except where otherwise stated, the specimens have been taken by me. Those taken by Mr. Templeton and Rev. J. Bristow I have examined and identified.—W. F. JOHNSON, Winder Terrace, Armagh : *March 30th*, 1889.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—This Society, which was recently established, has already held several meetings, at which interesting papers have been read. Its meetings are held in a room at the Medical Institute, Birmingham, which has been secured for the Society by its Council. The attendance at the meetings has been good, but fresh members are much wanted, in order to place the Council in

a position to purchase books for a library and carry out necessary work. Entomologists wishing to join are requested to communicate with the Hon. Sec., Mr. Colbran J. Wainwright, Hall Road, Handsworth, near Birmingham.

February 4th, 1889.—The President, Mr. W. G. BLATCH, in the Chair.

Rev. R. R. Rodgers and Messrs. J. B. Stone, J. H. Stone, H. Stone, and J. Wainwright were elected Members.

Mr. R. C. Bradley exhibited *Tortrices* taken in the district. Mr. G. W. Wynn, dark forms of *Miselia oxyacanthæ*, *Xylophasia monoglyphæ* and *Agrotis exclamationis*. Mr. E. C. Tye, varieties of *Abraxas grossulariata* and *Arctia Caia*. Mr. C. J. Wainwright, *Oporina croceago*, *Boarmia abietaria*, &c. The President then delivered an inaugural address on the "Prospects and proposed work of the Society," in which, among other things, he advocated the preparation and publication of carefully compiled lists of the local insect Fauna.

February 18th, 1889.—The President in the Chair.

Messrs. G. W. Tait, P. B. Mason, W. G. Blatch, Junr., and the Rev. Chas. F. Thornehill were elected Members.

Mr. R. C. Bradley exhibited specimens of the genera *Oporabia* and *Larentia*. Mr. C. J. Wainwright read a paper "On the *Cuspidatæ* of the Midlands," showing that the group was well represented.

March 4th, 1889.—The President in the Chair.

Messrs. F. Knight, F. A. Rolan, and Hodgkinson were elected Members.

Mr. R. C. Bradley exhibited larvæ of *Corethra plumicornis*. Mr. Blatch read the first of a series of papers, entitled "Contributions to the Entomology of the Midland Counties." The paper dealt with the *Coleoptera*, and showed a very large number of species to have been found. The paper was illustrated by Mr. Blatch's collection of Midland *Coleoptera*.

March 18th, 1889.—The President in the Chair.

Mr. J. F. Perry was elected a Member.

The evening was devoted to the *Rhopalocera* of the district; Messrs. R. C. Bradley, C. J. Wainwright, and the Rev. Chas. F. Thornehill, exhibiting specimens and reading notes upon them. Mr. Thornehill showed fine series of *Thecla W-album*, *T. pruni*, *Caterocephalus Palæmon* (*Paniscus*), *Hesperia Actæon*, *H. comma*, &c.—C. J. WAINWRIGHT, Hon. Sec.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY,
March 28th, 1889.—T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Messrs. J. E. Cutts, of Watford, W. T. Sturt, of Kingston, and W. G. Macmurdo, of Wansted, were elected Members.

Mr. Hawes exhibited a variety of *Epinephele Janira*, L., with additional spots on the primaries, and two varieties of *Zygana filipendulæ*, L., captured in July,

1876, near Oakleigh Park. Mr. Tugwell, specimens of *Deilephila galii*, Schiff., bred by him from the large number of larvæ taken by him at Deal, in 1888, together with continental examples of the species, and remarked that the most probable explanation of the unusual abundance of *galii* last season was that of immigration. Mr. Billups exhibited exotic *Orthoptera*, *Hemiptera*, and *Homoptera*, and three species of *Coleoptera*—*Sagra Buquetii*, Lac., from Java, *S. chrysochlora*, Lac., from Australasia, and *S. cærulata*, Lac., from Madagascar. Mr. W. West, two specimens of *Calosoma sycophanta*, L. (♂ and ♀), one captured in 1873, at Freshwater Bay, and the other in Greenwich Park, in 1888. The remainder of the evening was devoted to an exhibition of microscopical objects by the members.

April 11th, 1889.—The President in the Chair.

Messrs. A. Dennis, of Kingsland, and G. E. Dench, of Tufnell Park, were elected Members.

Mr. Tugwell exhibited a bred series of *Nyssia hispidaria*, Hb., showing extreme form of dark coloration, and bred series of *Tæniocampa leucographa*, Hüb. Mr. R. Adkin, *Euchromia mygindana*, Schiff., *E. arbutella*, L., and *Coccyx nemorivaga*, Tgstr., bred from larvæ in shoots of the common bearberry (*Arctostaphylos uva-ursi*, Spreng.), from Forres. Mr. South, series of *Plusia iota*, L., including two of the variety *percontationis*, *P. pulchrina*, Haw., and made some remarks on the differences; two series of *Epunda lichenea*, Hüb., one from Plymouth, and the other from Portland; the specimens from the first mentioned locality were fairly typical, the others were small, greenish-grey specimens, with but little, if any, of the pink or reddish tinge characteristic of the type; *Eubolia limitata*, Scop., and *Bupalus piniaria*, L., from various localities. Mr. Jenner Weir, some butterflies, which he has desquamated by the "Waterhouse process," and remarked that although the scales of the wings were dissolved, yet the hairs remained unaffected, and that the green pattern on the wings of such butterflies of *Papilio lurlinus* and *Tirumala Petiverana* retained its colour after the desquamation, the markings were, therefore, not merely superficial in these insects. A paper, "On the origin of the genus *Anthocharis*, Bdv.," by Mr. Cockerell, was read; he, Mr. Cockerell, was of opinion that the genus was by no means ancient, and that it arose directly from an old *Pierid* stock, and that probably on the American continent; Mr. Weir, Mr. South, and Mr. Tutt made some observations on Mr. Cockerell's paper. Mr. Wilkinson exhibited several species of Scorpions.—H. W. BARKER, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON: *April 3rd, 1889.*—Mr. F. DU-CANE GODMAN, M.A., F.R.S., Vice-President, in the Chair.

Mr. A. Cant, of 93, Robert Street, Regent's Park, N.W.; Mr. C. Cave, of 13, Lowndes Square, S.W.; Mr. N. F. Dobrée, of The New Walk, Beverley; Mr. J. Harrison, of Gawber Road, Barnsley; Mr. S. L. Mosley, of Beaumont Park, Huddersfield; and Mr. B. G. Nevinson, M.A., F.Z.S., of 6, Tite Street, Chelsea, S.W., were elected Fellows.

Mr. Osbert Salvin exhibited specimens of *Ornithoptera trojana*, Staud., and *O. Plateni*, Staud., received from Dr. Staudinger, and obtained in Palawan, an island

between Borneo and the Philippines. He remarked that *Ornithoptera trojana* was allied to *O. Brookiana*, Wall.

Mr. R. McLachlan exhibited, and made remarks on, several examples of *Æschna borealis*, Zett., a little-known species of European Dragonflies. He said that some of the specimens were captured by himself at Rannoch, Scotland, in June, 1865, when he was accompanied by Dr. Sharp and the late Mr. E. C. Rye. The other specimens were taken at Luleå, North Sweden, and in the Upper Engadine (5000 to 6000 ft.), in Switzerland.

Mr. W. H. B. Fletcher exhibited specimens of *Agrotis pyrophila* from various localities, including two from Portland, three from Forres of a smaller and darker form taken by Mr. Salvage last year, and a melanic specimen from Stornoway, at first supposed to belong to *A. lucerneæ*, but which, on closer examination, was seen to be referable to this species. He also exhibited series of *Triphaena orbona* from Stornoway and Forres, and *T. subsequa* from Forres and the New Forest. The specimens of *T. subsequa* from Forres were more distinctly and richly marked than those from the New Forest, and were also rather more variable in colour.

Dr. Sharp exhibited specimens of *Proculus Goryi*, Kaup, found by Mr. Champion, in Guatemala, prepared to show the rudimentary wings under the soldered elytra. Dr. Sharp called attention to the existence of a peculiar articulated papilla at the base of one of the mandibles; and he also showed sections of the head of *Neleus interruptus* displaying this papilla, as well as the articulated teeth on the mandibles.

The Rev. Canon Fowler exhibited specimens of *Agapanthia lineatocollis*, Don, and remarked that they were able to produce a distinct stridulation by the movement of the head against the prothorax, and of the hinder part of the prothorax against the mesothorax; they were also able to produce an unpleasant scent. He further remarked that Dr. Chapman had lately informed him that *Erirrhinus maculatus*, F., had the power of stridulating strongly developed. He also exhibited a specimen of *Barynotus*, taken in Norfolk, which was apparently an abnormal example of *B. obscurus*.

Mr. Edward Saunders exhibited, on behalf of Mr. G. A. J. Rothney, in illustration of his paper on Indian Ants, specimens of the following:—*Camponotus compressus*, and fragments of *Solenopsis geminatus* destroyed by it; *Camponotus* sp. ?, with a mimicking spider (*Salticus* sp.); *Pseudomyrma bicolor*, with its mimicking *Salticus*, and a new species of *Rhinopsis*, viz., *ruficornis*, Cameron, also found with it, and closely resembling its host; *Diacamma vagans*, *Holcomyrmeæ indicus*, with specimens of the grain which it stores and the chaff which it rejects; and *Pheidologeton laboriosus*, with specimens of the various larvæ, shells, &c., which it collects; and *Aphænogaster* sp. with the pieces of *Minosa*, &c., with which it covers its nest.

Mr. G. A. J. Rothney communicated a paper entitled "Notes on Indian Ants."

Mr. Lionel de Nicéville communicated a paper entitled "Notes regarding *Delias Sunaca*, Moore, a Western Himalayan Butterfly."

Mr. H. J. Elwes communicated a note in support of the views expressed by Mr. de Nicéville in his paper.—H. GOSS and W. W. FOWLER, Joint Hon. Secs.

SUBSTITUTION OF A WING FOR A LEG IN *ZYGÆNA FILIPENDULÆ*,
AND NOTES ON THE YELLOW VARIETY OF THAT SPECIES.

BY NELSON M. RICHARDSON.

In the summer of 1887 I collected from a chalkpit near Cambridge about 700 pupæ of *Zygæna filipendulæ*, in order to breed the yellow variety of that species which occurred there. I bred a few (five or six, as far as I can remember) yellow ones, and also one specimen with five wings and only five legs: the left hind leg is absent, its place being occupied by a fifth wing. This specimen is a male of the ordinary red colour, of medium size ($1''\ 3\frac{1}{2}'''$ in expanse of wings), with the ordinary markings and perfectly developed; in fact, there is nothing at all unusual about it, except the extraordinary peculiarity above mentioned. The extra wing resembles an ordinary hind-wing of this species in shape and appearance, but is much smaller. It is $3'''$ in length and $2'''$ in breadth, whereas the hind-wing of this specimen is $4\frac{1}{2}'''$ long by $2\frac{1}{2}'''$ broad. The extra wing is much more thinly clothed with scales than the others, being most covered near the base. On the posterior margin of the basal half of this wing there is a distinct blackish border corresponding to that on the hind-wing. There is also a slight blackish border on the basal half of the under-side of the anterior margin. The outer half of the wing has very few scales, and these are mostly of a pale brickdust or brownish-red colour, some being quite colourless and transparent, so that the wing is red at the base, and shades off gradually into a faint brownish-red colour near the tip. The fringe on this outer half is of the colour of the adjacent part of the wing, but with a tinge of grey.

This wing is attached to the body along the line in which the first joint of the leg would lie if present, and by a junction rather more than $1'''$ in length; it would, therefore, probably have been quite immovable when the insect was alive. It has one or two slight longitudinal folds, but is not in any way deformed. The wing is inclined to the horizontal at an angle of about 30° , and points downwards and backwards, making an angle of about 45° with the body.

The area over which this colony of *Z. filipendulæ* was spread was not a large one, as they were, so far as my knowledge goes, pretty well confined to the old chalkpit, which was not very extensive. There had probably, therefore, been much interbreeding since the colony had settled down within these limits; but as it is unlikely that the chalkpit had been unused and overgrown with herbage for a period reckoned by more than tens of years, I do not think that much weight could be attached to any theory founded on the fact of close interbreeding;

besides this, the colony was very numerous and flourishing, and I do not think that there were many cripples amongst the imagoes which I reared. They sailed happily out of my windows every morning, with the exception of the yellow ones and a few others which exhibited any peculiarity. There were no varieties worth mentioning, except as to size, in which they varied from 1" 1''' to 1" 7''' across the wings.

With regard to the yellow variety, which I have found both at Cambridge and also on some of the downs at Winchester, it is, as far as my experience goes, generally very uniform in colour and of a pale yellow. I have seen a darker yellow specimen, almost orange, but I have found such intermediate forms very uncommon; on the other hand, the only specimen of the red variety which had any tendency to yellow was one from Cambridge. The scales on this specimen are seen, with the help of a microscope, to be of a pale brickdust colour, and not so numerous as usual, especially on the hind-wings, which, when viewed with the naked eye, are paler and browner than those of typical specimens. On examining some of the latter from the Cambridge chalkpit with a microscope, I find that most of them have here and there one or two of these light brickdust coloured scales amongst the bright red ones, some more and some less, but I have not been able to see any yellow scales on any red moths, or any red or brickdust scales on any yellow moths.

It would be interesting to know whether these light brickdust coloured scales occur on red specimens in localities which do not produce the yellow variety (I at present possess none but Cambridge specimens), if I am right in thinking that it is not to be found wherever the insect occurs. Here and at Portland *Z. filipendulæ* is fairly common in the red form, but I have not seen a yellow one. I have been told, however, that the yellow variety has occurred on some hills at a short distance from Weymouth, but I have not collected there sufficiently to say anything from personal observation.

Perhaps some of your correspondents would give their experience of the variations of this insect in other localities. I will try to investigate the matter here this summer.

Montevideo, near Weymouth :

April 10th, 1889.

[Insects with three wings on one side have been often recorded, but usually the insertion of the supplementary wing is between the two others. We do not recollect a recorded instance of a wing taking the place of a leg. We have seen the specimen.—Eds.]

Acrolepia assectella, Zeller.—Amongst a lot of *Tineidæ* which I purchased at the sale of the late Mr. A. F. Sheppard's collection I detected a species I did not know; it was included with a number of obscure and not easily determined *Depressariæ*, *Gelechidæ*, &c., and no doubt placed there for further examination, and as there were no foreign insects amongst them, and as it was pinned like all the others, I have not the least doubt it is a British specimen, and shall not hesitate in placing it in my collection. I am indebted to the kindness of Mr. H. T. Stainton for determining the species.—SAMUEL STEVENS, "Loanda," Beulah Hill, Upper Norwood: May 10th, 1889.

A FEW WORDS ABOUT *ACROLEPIA ASSECTELLA*.

BY H. T. STANTON, F.R.S.

In 1862 the late Doctor Breyer, of Brussels, published in the 6th volume of the *Annales de la Société Entomologique Belge* (pp. 21, 22) a very interesting and instructive notice of this insect, which I reproduce here:—

"Our common onion (*Allium cepa*) is a biennial; the first year produces the onion, it is not till the second year that the flowering stem arises, which produces the seeds. The flowers are placed in a cluster on the top of the stem, which begins to shoot up in the spring, the flowers open in June, and the seeds are ripe towards the end of September.

"When examining, lately, in a kitchen garden, some onions which had gone to seed, I was struck with the appearance of the plants being diseased; several stems were completely divested of the seed-heads, others had the umbel of seeds so loose that the slightest touch sufficed to knock off all the peduncles at once.

"These peduncles were gnawed at their bases, and their junction with the main stem had been transformed into a powdery mass.

"Here was, evidently, the work of some insect larva, and by no means a disease of the plant.

"Whilst blowing over this dust I immediately found a quantity of small larvæ, which, at a first glance, looked like Dipterous larvæ, but a closer examination showed them to be Lepidopterous. In fact, these were the larvæ of *Acrolepia assectella*.

"The larva is of a transparent dirty yellow, like old bits of polished bone; it bears on the second segment a small thoracic shield, and is marked with two rows of little black dots, hardly visible to the naked eye; it is slightly attenuated in front, but rather swollen behind during repose.

"It lives in companies inside the flowering stem of the onion, not making separate galleries and not ejecting its excrement.

"Towards the beginning of September the larvæ are full fed and quit the stem, some perforating holes for that purpose, but the greater number emerging by the top of the stem. They spin up separately, being only social in the larval state, some spin up amongst the peduncles, but the greater number descend and disperse on reaching the ground. The cocoon which they form is very pretty, white, silky, with net-work, and somewhat firm.

"In three weeks time the imago appears; it lives through the winter, and in the following spring the female deposits her eggs on the young flowering stem of the onions grown for seed.

"*Assectella* must be considered as an insect injurious to horticulture, as though not absolutely damaging the plant in which it lives, it diminishes the number of seeds in the expected crop."

Kaltenbach, in his "Die Pflanzenfeinde aus der Klasse der Insecten" (p. 720), says that "the small yellowish-green larva feeds in July, August and September, in the tubular leaves of the onion (*Allium cepa*); it is found just as abundantly in the heart-leaves of the leek (*Allium porrum*), which it often, in company with a Dipterous larva, eats down to the root. It assumes the pupa state, outside the food-plant, in a loose, elongate cocoon. The imago appears in from eight to ten days, and there is a second brood in September and October. The first brood of the imago appears in July and August."

It has always been a wonder to me that this species, which is common at Brussels and common at Paris, should never have been recorded as British. The same feeling of wonder has no doubt been felt by German Entomologists, and hence, as we have an *Acrolepia betuletella*, which does not occur with them, they have assumed that our *betuletella* must be their *assectella*, and thus we constantly find they give that as a synonym, and many, as Curtis' name has one year priority over Zeller's, use the name *betulella* or *betuletella* for *assectella*. This, however, is a mistake, the two insects are essentially different, *assectella* is always grey, *betuletella* always, more or less, brown; moreover, in *betuletella* the anterior-wings are considerably narrower than in *assectella*; the pale dorsal spot is more expanded on the inner margin in *assectella*, whilst the subapical black spot is much more pronounced in *betuletella*. Unfortunately, *assectella*, like many another internal feeder, is extremely apt to turn greasy, and most of my bred specimens have undergone that process.

Probably most of our nurserymen, who grow onions for seed, are well acquainted with the larvæ of *assectella*, their gregarious habits necessarily impressing the most unobservant, though very likely they only know them as "nasty white maggots," and would be much surprised to hear that they had a money value amongst collectors of insects.

Mountsfield, Lewisham :

May 16th, 1889.

ANDRENA AND STYLOPS.

BY EDWARD SAUNDERS, F.L.S.

I was at St. Leonards at Easter this year, and on the Croft, Hastings, was fortunate in taking several specimens of *Andrena atriceps* attacked by *Stylops*. On my return home I looked up such other specimens of *Stylopized Andrenæ* as I possessed, and I propose to offer a few remarks on them.

In my "Synopsis of British *Hymenoptera*" (Trans. Ent. Soc. Lond., 1882, p. 228) I made some observations on *Stylopization*, quoting from a letter from Prof. Perez, of Bordeaux, on the subject. Since then the Professor has published, in the "Actes de la Société Linnéenne de Bordeaux, 1886," a most interesting memoir, entitled, "Des effets du Parasitisme des *Stylops* sur les Apiaires du genre *Andrena*," in which he enumerates the various changes, external and internal, that he has noticed as the result of the action of the parasite, and it may not be uninteresting to mention here some of the chief changes which he notices to have been effected in the host by the presence of this curious Coleopteron. In most cases I have observed the same peculiarities myself, so that I can fully corroborate the remarks he makes.

In the *Stylopized* form, the abdomen becomes more globose, and the posterior margin of its 5th segment becomes shortened and its teguments thinner; the head narrower and smaller; the puncturation and villosity of the entire insect denser; and, in the case of *Andrenæ*, such as *squamifera*, in which the pubescence is depressed and scalelike (of this form we have no British exponent), the pubescence tends to become elongate and like the usual form; and, as I mentioned in my Synopsis, either sex, when affected by the parasite, tends to lose its peculiar sexual features, and to assimilate to a common type. This is strikingly observable in the reduction of the size and the alteration of

the colour of the pollen brushes on the posterior tibiæ of the ♀ of such *Andrenæ* as *atriceps*, *nigroænea*, and *Trimmerana*, as also of the flocculus of the trochanter and the femoral hairs; in the alteration of the colour of the hairs of the face, and of the colour of the actual tegument in such species where the clypeus and cheeks in the ♂ are more or less white, as in *labialis*. Stylopized specimens of this species, if ♂, tend to have the white features of the face reduced in size and altered in shape, and if ♀, to have the ordinary brown face more or less spotted with white; there are also slight alterations in the respective lengths of the antennal joints, in the size, &c., of the ♂ and ♀ genital armature.

Prof. Perez also discusses at length the internal effects produced by the parasite.

Towards the end of his paper he mentions that the majority of the attacked specimens which he has examined bear only one *Stylops*; that of those which bear two, they are placed almost always between the 4th and 5th segments; once he has observed two under the 3rd, and twice one under the 3rd and one under the 4th; once again he found two on one side under the 4th. Of specimens attacked by three *Stylops* he had only known two, one bore three under the 4th, placed symmetrically; and one bore two under the 3rd and one under the 4th, all on the left side. Of specimens bearing four he had never seen an example, but mentions F. Smith having received a specimen of *A. victima* from New Caledonia so affected.

Among the Stylopized specimens I possess I find, like him, the majority bearing one *Stylops* under the 4th segment. I have two specimens bearing each two *Stylops*; in both, these are placed one on each side under the 4th. I have two specimens bearing three *Stylops*; in one there is one under the 3rd and two under the 4th, and in the other all three are under the 4th—one exactly in the middle, and one, as close to it as possible, on each side. I have two specimens also with four *Stylops*; one, a ♀ *Trimmerana*, with two under the 3rd segment and two under the 4th, each about midway between the centre and the lateral edge of the margin; the other an *atriceps* ♀, which I caught at Hastings this year, which has one *Stylops* a little to the left under the 3rd segment and three under the 4th, the middle one about the centre of the margin and the others one on each side.

Professor Perez has seen specimens with a *Stylops* under the 5th segment, but I have never met with one myself; it seems that under the 4th segment is the favourite locality, and then under the 3rd.

In this country the species most frequently attacked are, I think without doubt, *Andrena atriceps* and *Afzeliella*, after them *Trimmerana* and *nigroænea*, and then *labialis*; the other species are rarely attacked, although the presence of the parasite has been noticed in twenty of our British species. In many cases, although the *Andrena* is clearly "Stylopized," the actual *Stylops* is not to be seen: either it may have emerged (if a ♂) before the capture of the bee; or it may, as Prof. Perez has observed, be entirely inside the abdomen, and so hidden; or, as he suggests in some cases, it may have been in the larva of the *Andrena*, and its action influenced it in that stage, and escaped in the change from nymph to imago.

There are so many curious and interesting questions unsolved connected with Stylopization, that a wide field is still open for research.

If any one possesses any Stylopized specimens which are of no value to him, I should be very glad to receive them, and to give other *Hymenoptera*, *Hemiptera*, or *Coleoptera* in exchange.

St. Ann's, Mount Hermon, Woking:

May 9th, 1889.

NOTES ON MR. EDWARDS' PAPER ON *SCOLOPOSTETHUS*.

BY EDWARD SAUNDERS, F.L.S.

As Mr. Edwards and I have agreed to differ as to the number of species in this genus, I will briefly state here my reasons for not adhering to his views.

In the first place, I cannot at all agree with him as to the value he attaches to the coloration of the antennæ; in fact, I distrust colour altogether, in such organs as the antennæ, as a valid character for specific distinction. I have the further reason for not admitting colour in the species of this genus, that I fail to appreciate the constancy of the character; it seems to me that it is distinctly variable: for instance, I have specimens of *affinis*, as Mr. Edwards admits, with the antennæ entirely yellow-brown, why he should attribute this to immaturity any more than any other case of variation where pale colour is more prevalent than in the type, I do not know; for myself, I regard most pale colour as due to fixed immaturity. I have also specimens with the whole of the 2nd joint, and the base of the 3rd, pale; I have specimens with the apex of the 2nd joint distinctly clouded; I have specimens with the apex of the 2nd joint black,

gradually shading into yellow at the base: these Mr. Edwards calls *punctatus*, of which more hereafter; of *neglectus*, I have specimens with only the apical one-eighth of the 2nd joint black, others with at least the apical one-third black, this applies to both sexes; of *decoratus*, I have specimens taken off heath (I do not speak of those taken on nettles by myself at Ilfracombe) with only the extreme base of the 2nd joint pale, I have others with a third of the joint pale.

In the face of this variability, I must continue to doubt the wisdom of employing colour in this genus as a specific character.

Next, as to form. I am prepared to leave *pictus* as a species for the present, as its antennæ, as I pointed out at page 148 of the current vol. of this Magazine, and as has been observed by nearly all writers on the genus, are certainly thinner and longer than in the other species, and are entirely pale, but it is so rare that to my mind the constancy of these characters is hardly established.

Mr. Edwards makes two species with mesosternal tubercles, *affinis* and *punctatus*; both have the prosternum deeply and closely punctured; these he distinguishes apart by the colour of the 2nd antennal joints, by the adoption of which character he throws them into different sections of the genus; he also distinguishes them by the form of the ♂ genital styles. He has very kindly lent me his dissections to examine, and I am bound to say that I fail to appreciate the differences shown in his figures. He mentions the apical lobe of the style in *punctatus* as being without hairs, to me and to a friend of mine who examined the styles with me, under a $\frac{1}{4}$ -inch objective, the hairs are distinctly visible, and spring from foveæ in the same way as they appear to do in *affinis*; under the least change of aspect a different form of the style presents itself, and I cannot but think that the difference shown in Mr. Edwards' figures is more due to difference of aspect than of form.

Mr. Edwards' other three species are without tubercles. *Adjunctus* is only admitted on a statement of Mr. Douglas' (Ent. Mo. Mag., xi, p. 265), and no British exponent is known of it; to my mind, if there were one it would be only a colour variety of *decoratus*: at any rate, until a specimen occurs in this country, I doubt the wisdom of inserting it in our lists.

Neglectus, Edw.: here, I think, Mr. Edwards' grounds are much firmer; the genital styles certainly are different in form from those of *decoratus*, but I do not feel sure yet that such a difference may not be due to development; still, if developed *neglectus* (with which I am unacquainted) should possess styles shaped as in the undeveloped

form, I should gladly agree with Mr. Edwards that the two species should be maintained. I still entertain the idea from finding both species together on nettles at Ilfracombe, that developed *neglectus* will be found identical with *decoratus*.

Such critical examinations as these of Mr. Edwards' are always useful; I only regret that I cannot follow his views.

St. Ann's, Woking:

March 3rd, 1889.

THREE NEW SPECIES OF COLEOPTERA FROM JAPAN.

BY H. W. BATES, F.R.S.

NEBRIA LEECHII, *n. sp.*

N. Sadona, var. vel ♂ ?, Bates, Trans. Ent. Soc., 1883, p. 217.

Mr. Leech obtained both sexes of this species, which proves to be distinct from, though closely allied to, *N. Sadona*. The chief difference lies in the form of the thorax, which, in *N. Sadona*, is rather narrow at the base, with produced and acute hind angles, and dilated anteriorly in a strong curve (almost as in *N. crenatostrciata*); but in both sexes of *N. Leechii* it is much more gradually widened (almost as in *N. Lafrenayi*). The thorax in *N. Sadona* is further peculiar in narrowing again, strongly, to the anterior angles, which are scarcely at all produced and rounded, whilst they are much produced in *N. Leechii*. The elytra are narrower and more parallel and the eyes much more prominent than in *N. Lafrenayi*.

Mr. Leech's examples are from the neighbourhood of Nikko.

APHODIUS ECCOPTUS, *n. sp.*

Sub-gen. Melinoptero (Muls.), *referendus*. *Elongatus parum convexus, nigro vel castaneo-fuscus, femoribus ventroque sordide testaceis elytris haud dense recumbente fulvo-pubescentibus; capite discrete punctulato, inermi, clypeo semicirculari, genis haud productis, obtusis; thorace apud angulos posticos valde sinuato, margine laterali incrassato, basali medio immarginato, disco æqualiter discrete punctulato; elytris punctulato-striatis, interstitiis medio convexis sparse punctulatis, striis 3—7 apice abbreviatis; tibiis posticis apice spinis inæqualibus.*

Long., 8 mm.

Nikko (Leech). In Mr. G. Lewis's collection also from the same locality.

Resembles most the series of allied Mexican species of which *A. mexicanus* is the type; but it differs from all in the large and deep emargination of the hind angles of the thorax. Anterior to this emargination the sides of the thorax are very slightly arcuated and

converging in front, and the margin in this part is thickened and separated from the disc by a groove-like depression. The unequal apical bristles of the hind tibiæ are very stout, almost spiniform.

HOPLIA MACULATA (Lewis MS.), *n. sp.*

H. aureolæ (Pall.), *proxime affinis et quoad formam simillima; differt suprà squamis pallide fulvis haud metallicis et corpore subtus femoribus pygidioque late auris: oblonga suprà breviter sat sparsim setosa, thorace vittis duabus medianis, elytris utrinque striga irregulari haud procul a sutura postice divergenti maculisque tribus lateralibus (prima humerali) strigisque vagis marginalibus fusco-nigris; clypeo sicut in H. aureola brevi antice angustato margineque sinuato; thorace medio rotundato angulis posticis obtusis; tibiis et tarsis nigris sparsissime squamosis. Ungues sicut in H. aureola.*

Long. (♂), 8 mm.

Satsuma, Japan (Leech). The species was also taken by Mr. G. Lewis, but only, I believe, in one example, and it appears to be rare.

London: 1889.

DESCRIPTION OF THE LARVA OF *COSMIA AFFINIS*.

BY G. T. PORRITT, F.L.S.

On the 5th June, 1886, I received three larvæ of this species from the Rev. G. H. Raynor, of Cambridge. They were feeding on elm, and two days later I described them as follows:—

Length rather over an inch, and of average proportionate bulk; head glossy, the lobes rounded, about the same width as the second, but narrower than the third and following segments; body cylindrical, but has an uneven appearance owing to the clearly cut segmental divisions; it tapers from the 5th segment to the head, and the 13th segment shelves off abruptly from above and appears much narrower than those preceding it; skin soft, and sufficiently transparent for the working of the internal organs to be seen through it. Ground colour bright pale green, the head with a slight yellow tinge; dorsal stripe clear white, as are also the narrower sub-dorsal stripes; spiracular stripes also white but having a faint yellowish tinge which is wanting in the other stripes, and above them, in one of the specimens, is an irregularly defined stripe of dark green, which, on the 2nd, 3rd and 4th segments, takes the form of black streaks; the large round spiracles are white, enclosing an intensely black spot, and immediately over, but touching each spiracle, is another considerably smaller white spot, which also encloses a minute but equally black dot; the rather small tubercular spots are white. Ventral surface and prolegs uniformly light green, the anterior legs on the outside are black ringed with whitish.

In a few days the larvæ spun rather loose cocoons under the leaves or moss at the bottom of their cage, and two moths emerged on July 19th and 22nd respectively.

Huddersfield:

May 11th, 1889.

DESCRIPTIONS OF NEW SPECIES OF BUTTERFLIES CAPTURED BY
MR. C. M. WOODFORD IN THE SOLOMON ISLANDS.

BY H. GROSE SMITH, F.E.S.

ARGYRONYMPHA RUBIANENSIS.

♂ and ♀. *Upper-side*: anterior-wings brown, with dark brown, broad marginal border as in *ugiensis*, Mathew. Posterior-wings brown at the base to a little beyond the middle, thence to the margin shading into dark brown.

Under-side: anterior-wings pale brown at the base, gradually shading to chestnut-brown at the margins. A submarginal silvery stripe, narrowly bordered externally with black, extending partially along the costa near the apex, near the posterior angle turning inwardly for about one-fourth the extent of the wings, thence turning upwards as far as the upper median nervule, an ochreous stripe from near the apex to the lowest median nervule, inside and parallel to the submarginal silvery stripe, its lower third being within both the silver stripes. Posterior-wings: basal half grey shaded with brown, outside which is a sinuate rufous-brown band, bordered outwardly with a silver stripe, continued round by anal angle and outer margin, and with other markings as in *pulchra*, Mathew, except that in place of the two ochreous lunules, above the confluent black spots between the discoidal and subcostal nervules, is an ochreous quadrate spot.

Exp., $1\frac{1}{2}$ in.

Hab.: Rubiana Lagoon.

This species is between *ugiensis* and *pulchra*. It has the dark marginal border of the former on the upper-side of anterior-wings, and the markings (with the exception above stated) of *pulchra* on the under-side of posterior-wings.

ARGYRONYMPHA ULAVA.

♂ and ♀. *Upper-side*: both wings dusky greyish-brown, somewhat paler towards the base of anterior.

Under-side: both wings brownish-grey, the outer third dusky brown, with submarginal silvery stripes and markings as in *rubianensis*, but all paler and less distinct.

Exp., $1\frac{3}{4}$ in.

Hab.: Ulawa Island.

Near *pulchra* and *rubianensis*, but larger and more grey.

MYCALESIS INTERRUPTA.

♂. *Upper-side*: anterior-wings, with the inner two-thirds, bright brown; the outer half of the costa and the rest of the wings dark brown. A subapical black spot centred with white; a similar spot between the middle and lowest median nervules, the bright brown of the base extending above this spot between the upper and middle median nervules. Posterior-wings dark brown, rather paler towards the base and anal angle; two narrow submarginal dark brown lines, inside which are four black spots centred with white, the three lowest surrounded with a pale brown ring, the first spot nearly obsolete, the third much the largest.

Under-side: anterior-wings, basal half pale brown, shading into a bright chestnut-brown transverse line a little beyond the middle, followed by a pale yellowish-brown space shading outwardly to dusky brown, in which are two large black ocelli (the lower the larger), centred with white, surrounded with a bright brown ring margined with dark brown, the space beyond to the outer margin tawny, edged internally with a sinuate dark brown line, a similar submarginal line. Posterior-wings: basal half bluish-brown, shading into a bright chestnut-brown band a little beyond the middle; the space beyond greyish-blue, shading outwardly to dusky brown, in which are situated five ocelli, similar to those on anterior-wings, the first and fourth the largest, the second the smallest, the third and fifth about the same size; the space beyond tawny, with two submarginal lines as in anterior-wings.

Exp., 2 in.

Hab.: Rubiana Lagoon.

Nearest to *Messene*, Hew., and *Sara*, Mathew, but wings rather narrower.

AMBLYPODIA SOPHROSYNÉ.

♂. *Upper-side*: brilliant metallic azure-blue, shading along the costa of anterior, and the apex and outer-margins (which are black) of both wings, to ultramarine; costal area of posterior-wings brownish-black; abdominal fold greyish-brown.

Under-side: basal half of anterior-wings, a dark blotch beyond the cell, a rather oblique band of confluent spots, and a rather broad marginal band, dark olivaceous-brown, the rest of the wings very pale olivaceous-brown; two small silvery spots in the cell near the base, an oval silvery spot centred with brown near the end of the cell, an irregular whitish-brown line at the end of the cell, an indistinct reniform dusky marking below the cell. Posterior-wings: dark olivaceous-brown; a pale olivaceous-brown band from the apex, where it is rather broad, gradually narrowing down to the second median nervule; several pale olivaceous spots and markings near the base and across the middle; a narrow, submarginal, silvery-blue line above the tails, and thence to the anal angle, above which is a broad black band irregularly dentate inwardly, and intersected by an interrupted, irregular row of metallic blue markings.

♀. *Upper-side*: resembles the male, but darker; on the anterior-wings the costal, apical, and outer margins are broadly black, as well as the costal and apical portion of posterior-wings.

Under-side: same as the male, but paler.

Exp., 2 in.

Hab.: Guadalcanar.

Nearest to *Æxone*, Hew. The colouring of the male on the upper-side resembles *Sophax*, Mathew, which is a smaller insect; the under-sides are very different.

THECLA ALCESTIS.

♂. *Upper-side*: pale silvery-blue. Anterior-wings, costal margin, and apex rather broadly, and outer margin rather narrowly, greyish-black. Posterior-wings: with a broad, submarginal band of greyish-black spots crowned with white lunular markings, above which is a row of indistinct grey markings, the middle spot nearly

obsolete, below the spots is a row of narrow white lines; outer margin greyish-black, two tails of same colour tipped white.

Under-side: bluish-grey. Anterior-wings with a submarginal row of narrow pale grey lunules crowned with dark grey, inside which is a row of dark grey markings, obsolete towards the costa, a pale grey line edged internally with dark grey at the end of the cell. Posterior-wings with a row of black spots crowned with white and dark grey markings as on the upper-side, but the black spot before the anal angle is obsolete; above these is an interrupted pale silvery-blue narrow band, inside which is a row of red spots edged on each side with black, and pale grey beyond, the fourth red spot the largest, extending outwardly to the row of black spots, the spot above the obsolete black spot is sagittate, a black line edged with grey on both sides above the anal angle, a narrow dark line edged internally with pale grey at the end of the cell.

♀. Resembles the male, but is paler and more grey.

Exp., $1\frac{1}{4}$ in.

Hab.: Gela.

CHARAXES ATTILA.

♂. *Upper-side*: anterior-wings resemble *Jupiter*, Butl., but the spot at the end of the cell is larger. Posterior-wings also resemble *Jupiter*, but the pale ochraceous central area is more dilated; the submarginal row of blue-green spots does not extend beyond the first subcostal nervule, and is followed externally by a rather broad, blue-green, sinuated band, from the second subcostal nervule to the anal angle; outer margin rather broadly black, with two black tails; there is no ferruginous spot at the anal angle.

Under-side differs from *Jupiter* on anterior-wings in the white space beyond the cell not being crossed by the broad black line between the second discoidal and upper median nervules, the cell is white, crossed by a broad straight bar, not indented as in *Jupiter*. On the posterior-wings the black markings are narrower, and less sharply defined; in place of the band of rufous lunules beyond the middle is an olivaceous-brown band, the part of the band below the upper median nervule being divided into lunules, narrower than in *Jupiter*, and less rufous; the black submarginal spots of *Jupiter* are represented by a rather broad sinuate black band, margined internally by a greyish-white band, the tails are black, without any colour down them. Both wings are paler and more olivaceous.

♀. *Upper-side*: anterior-wings resemble the male, but the spots are larger. On posterior-wings the central pale area is bordered externally by a distinct row of five blue-green lunules; there is a submarginal row of elongated spots, the first five partially white, the other two narrowly blue-green; a sinuated band of blue-green lunules near the margin, the colour extending down the tails, outer margin rather broadly black.

Under-side, like the male, but paler.

Exp., ♂, $3\frac{1}{2}$ in.; ♀, 4 in.

Hab.: Guadalcanar.

PIERIS AGNATA.

♂. *Upper-side*: both wings creamy-white, broadly bordered with black. Anterior-wings, base and basal half of costa irrorated with grey, rather broadly black

beyond, apex and outer margin very broadly black, the inner edge of the black border rather deeply sinuate. On the posterior-wings the black border narrows towards the anal angle, where it is irrorated internally with grey.

Under-side: anterior-wings white, greenish-yellow at the base, irrorated with grey; costal area, apex, and outer margin as on the upper-side, but towards the apex are three distinct, bright yellow, conical spots, under which are three more or less defined smaller white spots. Posterior-wings: inner three-fourths bright canary-yellow, outer fourth brownish-black, the inner edge of which is irregular, and in which are two irregular ill-defined yellow spots, the first below the second sub-costal nervule, the other below the upper median nervule.

♀. *Upper-side* resembles the male, but the wings are more stramineous and rounder.

Under-side: anterior-wings more grey, and spots paler. Posterior-wings: the basal three-fourths is pale orange-yellow, traversed by white veins. Exp., $2\frac{1}{8}$ in.

Hab.: Rubiana and Guadalecanar.

Near *latilimbata*, Butl., *discolor*, Mathew, and *quadricolor*, Godm. and Salv.

ELODINA UMBRATICA

♂. *Upper-side*, white. Anterior-wings with the base, basal part of the cell, and costal margin, as far as the middle, broadly dark grey, thence along the costa narrowly grey, until it joins a broad apical and outer marginal dark grey band, which on its inner edge at the upper median nervule is slightly sinuate, the band tapers towards the posterior angle.

Under-side, white, slightly tinged at the base of both wings and at the apex of anterior-wings with greenish-yellow; the dark apical area on the upper-side of anterior-wings indistinctly visible.

♀. *Upper-side*, resembles the male, but is greyer.

Under-side, with the base, costal and outer margins, and apex of anterior-wings, and the whole of the posterior-wings, stramineous. Exp., $1\frac{1}{8}$ in.

Hab.: Ulawa Island.

Nearest to *bouruensis*, Wall., and *Hypatia*, Feld., but wings more elongated, especially in the female; they also differ on the under-side.

PAPILIO PROSPERO.

♂. *Upper-side*: both wings black. Anterior-wings with an oblique, straight (not curved), subapical row of four milky-white spots, the first below the third sub-costal nervule quadrangular, the second smaller, triangular, the third and fourth larger and more elongated, indented outwardly, the fourth sharply so; a short narrow white line on the first subcostal nervule, nearer the base than the first spot; a large milky-white patch indented outwardly towards the posterior angle between the lowest median nervule and the submedian nervure. Posterior-wings with a broad milky-white band, as in *Hecataeus*, but more deeply and sharply serrated outwardly than in that species.

Under-side: anterior-wings as above, but without the spot between the lowest median nervule and the sub-median nervure. Posterior-wings with three sub-marginal, quadrate, ferruginous spots between the discoidal and median nervules, and an indication of another near the apex; a larger and brighter ferruginous spot above the anal angle, inside which, rather nearer the middle, between the discoidal and median nervules, are three patches of bluish-white scales.

Exp., $5\frac{1}{2}$ in.

♀. *Upper-side* resembles the female of *Hecateus*, Godm. and Salv., but differs as under: *Upper-side*: the patch in the cell and the discoidal row of spots are whiter, smaller, and less distinct, the marginal spots between the veins are very much larger, whiter, and quadrate. Posterior-wings: the central band of spots is much smaller, whiter, and indistinct, and extends only over the end of the cell, instead of over the outer two-thirds of it; the white patch on the abdominal fold is almost obsolete; the sub-marginal row of spots are more than double the size, white outwardly, shading into ferruginous inwardly; the white spot at the anal angle is confluent with the spot above it; the white marginal lunules between the veins are very much larger.

Under-side, as above, but more dusky; the central band of spots on posterior-wings smaller and less distinct. Exp., 6 in.

Hab.: Rubiana Lagoon.

The male differs from *Hecateus* on the upper-side, chiefly in having on the anterior-wings only an oblique, straight, subapical band of spots, and a spot near the posterior angle, instead of the curved row of spots which crosses the wings of *Hecateus*, and otherwise, as above described.

PAPILIO ARIEL.

♂. *Upper-side*: both wings black. Anterior-wings with a quadrate milky-white patch a little beyond the end of the cell, another above it conical; a very short white line at the junction of the 4th and 5th subcostal nervules, and an indistinct white line below the first-named patch. Posterior-wings, as in *Laarchus*, Godm. and Salv., but the white band is narrower and less deeply serrated externally. The ferruginous spot above the anal angle in *Laarchus* is in *Ariel* almost obsolete, and there is a minute white spot at the anal angle, which is absent in *Laarchus*.

Under-side: anterior-wings brownish-black, with three indistinct small patches of whitish scales about half-way between the end of the cell and the apex; small triangular white spots on the margin between all the veins; the small patch of white scales between the lowest median nervule and the submedian nervule of *Laarchus* is absent. Posterior-wings crossed beyond the cell by a row of seven ill-defined milky-white lunules, the two middle and the upper lunules almost obsolete, outside this row is a large ferruginous spot above the anal angle, followed between the veins by four patches of blue scales, the uppermost nearly obsolete, and at the apex a ferruginous indistinct patch; between the lowest median nervule and submedian nervule is a submarginal ferruginous patch, and a small white lunule at the anal angle. Exp., 5½ in.

Hab.: Estrella Bay, Isabel Island.

Differs from *Laarchus* chiefly in the smallness of the white patches on the anterior-wings, and the central row of white spots on the under-side of posterior-wings; also from *Ptolechnus*, Godm. and Salv., in the same respects, as well as in the absence of the four white submarginal lunules above the posterior angle on the upper-side of the anterior-wings of that species; the white band on the posterior-wings of *Ptolechnus* is also narrower, and does not extend into the cell.

DESCRIPTION OF THE LARVA OF *PHALERIA CADAVERINA*, F.

BY THE REV. CANON FOWLER, M.A., F.L.S.

Mr. G. C. Bignell having kindly sent me a colony of *P. cadaverina*, F., together with two of the larvæ of the insect, I take the opportunity of describing the latter, as I have hitherto seen no description in any of the works that I have come across. It is very closely allied to the arvæ of *Crypticus*, *Heliopathes*, and *Hopatrum*, and other *Tenebrionidæ*; in fact, the members of the whole family are very closely connected together by their larvæ, and in this state it would be often hard to distinguish many of the genera, which, in the perfect state, seem to be entirely dissimilar; there are, of course, exceptions, as in the case of *Bolitophagus* and *Scaphidema*, &c, but, as a rule, the larvæ of the *Tenebrionidæ* have a very strong family likeness to one another; they bear an extremely strong resemblance to the larvæ of *Agriotes*, &c., among the *Elateridæ*, the well-known "wire worms;" indeed, the chief differences consist in the fact that the *Tenebrionidæ* have the clypeus non-connate, and the labrum large and plainly visible, and also in the formation of the anal segment, which is much more simple in the latter family. The following is a description of the larva of *P. cadaverina*:—

Long., 11—12 mm.; lat., $1\frac{1}{2}$ mm. Elongate linear, scarcely narrower behind, of a lighter or darker ochreous colour, with the head dark brown, and the mandibles almost black; the claws also and spines of the legs are dark; head broad, with a shallow, transverse, V-shaped furrow, and with two obscure small dark spots in front; ocelli black, rather large, three in number on each side, placed close together in a somewhat oblique line, their separation being ill-defined; mandibles brown and strong, maxillæ brown, maxillary palpi three-jointed, with the joints about equal in length, and the last a little narrower than the penultimate; labium large, labial palpi two-jointed, the joints being formed like the apical joint of the maxillary palpi; antennæ short, three-jointed, arising from a prominence which gives them the appearance of being four-jointed, penultimate joint dilated, furnished at apex with two ridges, from the apical one of which arises the last joint, which is very small and subulate, and is terminated by a fine silky seta; body consisting of twelve segments, of which the prothorax is the largest; the latter segment is about as long as the meso- and meta-thorax together; the first eight abdominal segments vary a little in length, but do not call for any remark; the anal segment, however, is somewhat spoon-shaped, being slightly contracted at its junction with the eighth abdominal segment and rounded at apex; almost the whole upper surface is occupied by a broad, somewhat rugose, shallow excavation, the edges of which are ridged, except in front, and the apical margin is furnished with four small, but stout and distinct, dark tubercles; the front of the head is set with short, brown setæ, which might perhaps be more correctly designated as setose prominences, and the head and sides of the thoracic segments, and also the sides of the first abdominal segment, and of the penultimate segment posteriorly, as well as the sides and apex of the anal segment,

are furnished with fine silky setæ; beneath the anal segment there is a plate furnished with two comparatively long, fleshy prominences, which serve as prolegs; these are quite invisible from above; the insect has the power of retracting them at apex, so that they appear somewhat bifid when it begins to move, and they probably assist it largely in its somewhat rapid motions; legs short, but plainly visible from above, fossorial, setose, furnished with dark spines or spinose prominences, four spines and a small prominence on the tibiæ, two prominences on the femora, and one on the trochanters; the arrangement of these spines would probably afford a valuable character for distinguishing the larvæ of the different allied genera; they are, for instance, sharp and much less strong (as might be expected from the habits of the larvæ) in the case of *Tenebrio* than in *Opatrum* and *Phaleria*; the legs are terminated by a single claw.

The larva above described appears to be found with the perfect insect in sand under sea-weed and shore refuse; when disturbed it feigns death, and lies perfectly motionless for some time; under a high power, however, it will be noticed that the antennæ and usually the legs are constantly quivering, and immediately the insect thinks the danger is past, it turns quickly over and burrows rapidly into the sand, and soon disappears from view.

Lincoln: May, 1889.

Noctuæ at sugar in Norfolk.—To say that one has almost given up sugaring, seems like an admission of advancing years; so when Mr. Atmore reported last June that *Noctuæ* were thronging to the sugar as in the good old times, it was with a feeling as though renewing one's youth that I "shook off dull sloth" and brought the long neglected sugar-pot again into requisition. No very wonderful captures rewarded us, but I took—what I have wished to take for many a year—a fine specimen of the grey southern form of *Aplecta occulta*, and this I consider no contemptible prize. The same evening furnished one *Cymatophora ocularis*—on a poplar tree, of course. Another evening, and in a different place, an unusual variety of *Aplecta nebulosa* was secured; mottled all over with grey markings, except that the two transverse lines were white. As these lines are usually obscure in this species, the specimen had a very singular appearance, something like *Polia flavocincta*. Strange to say, we saw but one other specimen of this usually common species. *Cymatophora duplaris* was also very scarce, but one specimen occurred, entirely of a dark brown, though nothing like so dark as the northern and hill variety. *Leucania pudorina* and *Orthosia suspecta* also occurred, and *Caradrina alsines* was rather common. By sugaring on low plants at the edge of the mud flats along the coast I secured a very fine series of *Mamestra abjecta*. Here also occurred black and streaked varieties of *Agrotis corticea*, and various odd forms of *A. exclamationis*, some with large stigmata, or with them united, or having the transverse lines unusually distinct, or with the ground colour dappled with paler, also a specimen of the pretty variety of *A. nigricans*, formerly called *Marshallana*. A single specimen of *Hadena suasa* also turned up with common things "too numerous to mention."

One night, when sugaring at the side of a small wood close to the road, one of my boys netted a specimen of *Toxocampa pastinum*. I only mention this because the species was quite new to this district, and appears to be exceedingly scarce in Norfolk.—CHAS. G. BARRETT, King's Lynn, Norfolk: *March*, 1889.

Some Micro-Lepidoptera of Norfolk.—I made two or three attempts last summer to work the chalk district around Swaffham, but with very small results—which were, perhaps, attributable to the constantly cold winds—but on one of these occasions, I swept up from the short grass of an open field, where it was sheltered by beech trees, a specimen of the very rare and beautiful *Asychna æratella*. Long and careful sweeping on this and other days, although no *æratella* appeared, supplied a nice lot of *Gelechia artemisiella*, *Butalis fusco-cuprea*, and *Mimasioptilus bipunctidactylus*, var. *plagiodactylus*, and one *Argyrolepis subbaumanniana*. Nothing could be found except where there was some shelter from the bitter wind, but the district looks good. Among beeches *Tinea semifulvella* occurred with *Carpocapsa grossana* and *Eurymene dolabraria*.

Another evening, in a very different locality, a small piece of isolated fen, when musing upon the contrary nature of things in general—just then exemplified by the undesirable abundance of blood-thirsty *Diptera*, the equally objectionable scarcity of good *Lepidoptera*, and the fact that those which did occur flew with one accord into my companion's net!—I caught sight of a tiny moth flying over my head, which, when secured, proved to be *Gelechia lathyri*, a species which, although common at Wicken and at Merton, is quite new to this district and recorded from very few other localities.

On another occasion, while working the coast sandhills, I secured a single specimen of *Gelechia vicinella*, flying swiftly over the sand and looking much more conspicuous than the ordinary species—*desertella*, *senectella*, and *marmorea*. This also is excessively local, and, apparently, very scarce. A specimen taken on the Suffolk coast in the previous summer is the only other which has come under my notice for many years.—ID.

Variety of Thecla rubi.—On June 13th, 1888, I had the good fortune to capture at Studland, near Swanage, a specimen of the "green hairstreak" in which all the outer portion (amounting to nearly one-half) of the fore-wings is curiously bleached; and this bleaching extends also to the hind-wings, though not in quite so marked a degree, as it does not affect an equally broad portion of the wing.

Judging from the captures made in this county last season, it seems as though the cold and wet summer was particularly productive of remarkable varieties, some inclining to melanism, whilst others showed a tendency towards the opposite extreme.—EUSTACE R. BANKES, The Rectory, Corfe Castle, Dorset: *April 6th*, 1889.

Malformation in Hyponomeuta cognatella.—A strangely malformed individual of this species emerged in one of my breeding jars in July of last year. The right fore-wing is of the usual size, and measures 6 lines, but the left fore-wing, although perfectly developed, is only about $4\frac{1}{2}$ lines long, and does not exceed the length of the left hind-wing, which is more nearly of the normal size.—ID.

Remarkable variety of Cosmopteryx Schmiediella.—In a series of *C. Schmiediella* which I bred from larvæ in leaves of *Vicia sepium* in the end of June, 1888, were four examples of a peculiar variety which, so far as I am aware, has not been previously noticed. The three brilliant metallic fasciæ on the fore-wings are present as usual, but the broad orange band beyond the middle is entirely wanting, the space usually occupied by it being filled up by the black ground-colour; in two of these specimens, however, a few orange scales are just traceable in this space. Even in ordinary individuals this species varies greatly in the breadth and intensity of colour of this orange fascia.—ID.

Continuation of the late Mr. A. W. Scott's Australian Lepidoptera and their transformations.—We hear that the publication of the fine illustrated work on the life-histories of Australian *Lepidoptera*, of which three parts were published by the late Mr. A. W. Scott, under the title, "Australian Lepidoptera and their Transformations," is to be continued by the Trustees of the Australian Museum, Sydney. The work of editing the valuable material which was left by Mr. Scott, and of revising the classification and nomenclature of the species, has been entrusted to his daughter, Mrs. Edward Forde, and Mr. Sidney Olliff.—EDS.

Retinia posticana, Zett., bred.—In March last I visited the Scotch firs (out of which, on May 31st, 1888, I beat two examples of this insect) in the hope of ascertaining something about the mode of life of the larva. I began by examining the central buds of the terminal shoots, in which, if Mr. Barrett was right in considering it a small form of *turionana*, Hüb., it ought to have occurred; but though I inspected dozens of such shoots, I found no trace of anything resembling *turionana*. On the small side buds there were many little resinous webby processes, caused by young brownish-red, active larvæ, which I believed to be those of *R. pinivorana*, Zell. While collecting some of these, I found also here and there small lateral buds, generally in sheltered positions, that contained, without showing any resinous web, torpid larvæ, apparently full-fed, and four small glossy-black pupæ, resting, like *turionana*, head downwards, in an obliquely-inclined passage lined with white web. The larvæ all died. From the four pupæ three ichneumons emerged; the fourth, though still black, is, I fear, dead. At the beginning of the present month I had a second search. All the buds had by this time developed into shoots of various lengths, tenanted plentifully by the now nearly full grown larvæ of *pinivorana*; but after careful searching I secured six brown undeveloped buds, each containing a pupa, from which I have this week bred two ♀ *posticana*. The larvæ evidently prefer small *single* growing lateral buds near the ground on stunted trees; the tenanted buds were never more, often less, than half an inch long, so small, in fact, as to suggest the probability of the larva having fed up somewhere else before betaking itself to them. The pupa is *very considerably* smaller than that of *turionana*, glossy black and rather lively; the larvæ (as far as I could tell, for I did not disturb the few I got) dull red-brown. I cannot but think that this decided difference in the mode of feeding of the larva tends to strengthen my contention that *posticana*, Zett., is a distinct species, not merely a dwarfed form of *turionana*.—W. WARREN, 13, Cheyne Row, Chelsea, S.W.: May 20th, 1889.

Effect of the late inclement season on double-brooded moths.—There is no doubt that the cold summer of last year in some cases caused moths which are usually double-brooded to have but a single brood; and that the perfect insects taken this spring will consist (1) partly of those coming from larvæ that, proceeding from eggs laid in spring or early summer, will have fed up more slowly than the “first crop” of larvæ in ordinary seasons would have done; and (2) partly of moths coming from larvæ which, proceeding from the second emergence of moths and hatched very late (and from parents probably weakened by the cold of their larval period), will have fed up under very unfavourable conditions. The former may be, perhaps, expected to be not very different in appearance from the ordinary spring type, and may even be larger and darker, though I should not expect this; of the latter my experience in breeding the *Selenia* last summer inclines me to think that few will have survived, and these few will, I believe, be stunted and, in many cases, deformed. The former may be expected to be not very plentiful, because they are only a fraction of a brood, and will have been exposed to casualties for a longer period than usual; but abundance or scarcity depends on so many conditions, that prediction on that point would be hazardous. May I venture to suggest that it would be interesting to observe whether there is anything abnormal in the appearance or scarcity of the *Selenia* this spring, and, if so, to record it?—F. MERRIFIELD, 24, Vernon Terrace, Brighton: April, 1889.

The whirlwind as a distributing agent.—It has been a warm, sultry day to-day, and the insects, including a couple of *Vanessa cardui*, are out and about in West Cliff. As I went up the street about mid-day, I saw a little whirlwind blowing dust and débris up into the air—quite a small affair, for I, standing about ten yards from it, could not feel a breath of it. Several papers were in the road, and up they went: one, in particular, could not have been smaller than 18 inches by 9. I watched this to see how high it would go, and was surprised to see it mount up and up, till finally I lost sight of it from its very height—for all I know it may have ascended half a mile or more. These whirlwinds are very frequent in this dry country, and it is easy to see how not only winged and feathered seeds, spores of cryptogamia, but even insects that of their own volition could not or would not travel a mile from their birthplace, might get carried up in this way, and meeting some strong current of the upper regions of the air, get wafted over mountain chains and over, perhaps, hundreds of miles of country before alighting. The whirlwind has long been acknowledged as a factor in distribution, but it is interesting to have direct evidence of its powers.—T. D. A. COCKERELL, West Cliff, Custer Co., Colorado: April 24th, 1889.

Brachycentrus subnubilus clustered on the under-side of leaves of *Symphytum officinale*.—I have again to record a phenomenon similar to that recorded by me in Proc. Ent. Soc., 1874, p. xi; Ent. Mo. Mag., xi, p. 13. On the 9th inst., when examining leaves of *Symphytum* along the banks of the River Lea, I found *B. subnubilus*, ♂, clustered on them, in a dead or dying state. The males and females were flying around in fairly equal numbers, but on the leaves the latter were practically absent, for out of about thirty insects on one small leaf there was not one female. This agrees with what I observed in 1874. The insects appeared to be entangled in

the hairs of only the under-side of the leaves, never on the upper; but if they go there merely to rest, it is odd why only one sex should be caught, and also why they should be in clusters. Has any one else observed this habit? One ♂ that managed to disengage itself from the hairs flew about my dining room, but in a stupid manner, quite different from the ordinary flight of the insect.—W. C. BOYD, College Road, Cheshunt: *May 15th*, 1889.

[I think I once expressed an idea that this peculiar habit and effect might be due to sudden fall in temperature: search for shelter in the first instance and subsequent death. But it seems probable that the insects (possibly seeking shelter) become entangled in the hairs of the leaves, and cannot release themselves. Why they should practically be all males I do not comprehend, unless there be (as is often the case in insects) periods when the males fly in abundance and the females not at all. It is a curious question meriting further investigation.—R. McLACHLAN.].

Obituary.

August Emil Holmgrèn.—It has only been lately announced in entomological periodicals that this celebrated Swedish Hymenopterist died quite at the end of 1888. At this moment we have no particulars as to his history other than his *work*, which mainly concerned *Ichneumonidæ*, and has universally been acknowledged of the highest order, mainly concerning the Swedish Fauna, but supplementing the laborious monograph of his predecessor Gravenhorst for the whole of Europe. Almost all his published papers, from the first in 1852, were devoted to his special subject. His survivor, and fellow-worker, Dr. Kriechbaumer, has paid a generous tribute to his memory in the "Entomol. Nachrichten," 1889, p. 144.

Dr. Victor Signoret died at Paris on April 3rd last, at the age of 72. For more than forty years he has been a most indefatigable worker in scientific entomology, his labours having been almost exclusively devoted to *Hemiptera*, and the results, with few exceptions, have been published in the "Annales de la Société Entomologique de France." The value of his many papers is too well known and appreciated to require any eulogy; it may be permitted, however, to mention the principal of his Memoirs, all elaborated with most conscientious care, and illustrated by himself with the greatest delicacy of drawing in the minutest details. Such are his "Revue iconographique des Tettigonides," "Essai sur les Cochenilles," and "Revision du Groupe des Cydnides," the last having appeared as lately as 1884. For the last few years he has suffered from insidious and progressive paralysis, and now he has been removed from his many friends to whom he was endeared by a most obliging disposition, always ready to put his entomological knowledge and acquisitions at their service. He was a member of many learned Societies; and an Honorary Fellow of the Entomological Society of London since 1882. He became a member of that of France in 1843, and was on the honorary list of the Society since 1882. At present we are without details as to his early history, &c.; these will be fully given by his old and faithful friend and fellow-labourer, M. Léon Fairmaire, to whom has been entrusted the task of writing his "nécrologe" for the French Annales; it could not be in better hands.

BIRMINGHAM ENTOMOLOGICAL SOCIETY: *April 1st*, 1889.—Mr. W. G. BLATCH, President, in the Chair.

Mr. George H. Kenrick, Edgbaston, was elected a Member.

Dr. P. B. Mason exhibited five *Eupithecia extensaria* and one preserved larva. One was the specimen taken some years ago by Mr. Prest, and upon which its introduction into the British lists was based. The remaining specimens and the larva were some of those taken by Messrs. Atmore and Barrett in Norfolk last year.

Mr. C. J. Wainwright read a paper "On the *Eupithecia* of the Midlands." At its close Dr. Mason made remarks on the group. The Rev. Charles F. Thorne will exhibited his drawer containing the group, and made remarks upon them. Remarks were made and specimens exhibited also by Messrs. R. C. Bradley, J. F. Perry, and H. Stone.

April 15th, 1889.—The President in the Chair.

Mr. Neville Chamberlain, Highbury, Moor Green, and Mr. D. Barron, Brightwell, Edgbaston, were elected Members.

Mr. E. C. Tye recorded the capture of *Endromis versicolora* at Wyre Forest last year, and read notes upon it.

Mr. R. C. Bradley exhibited a fine series of *Brephos parthenias*, taken at Trench Woods in March this year.

Mr. C. J. Wainwright exhibited *Deilephila galii*, taken in Handsworth last summer; and several other species.

Mr. H. Stone exhibited a number of the food-plants of Lepidopterous larvæ.

Mr. W. G. Blatch made some interesting remarks on an extraordinary find near Knowle. On a mossy bank facing the North, about 2 × 3 yards, he has taken, during a few short visits in March and April, one hundred and forty-five species of *Coleoptera*, including *Amara nitida* (Sturm.), *Homalota atomaria*, and many other very rare species. The bank is by no means exhausted yet. The remarks were illustrated by the specimens.

May 6th, 1889.—The President in the Chair.

Mr. A. H. Martineau, Solihull, was elected a Member.

Mr. Blatch exhibited *Hylobius abietis* from Sutton Park.

Rev. Charles Thorne will mentioned the capture of *Fidonia atomaria* on May 4th.

A paper was then read by Mr. Thorne will "On the genus *Dianthæcia*;" dealing mainly with the life-history of *D. conspersa*, *capsincola*, *carpophaga*, and *cucubali*. The paper was illustrated by a fine series of specimens.—COLBRAN J. WAINWRIGHT, Hon. Sec.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, *April 25th*, 1889.—T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Mr. W. Cant, of Regent's Park, and R. Fortune, of Harrogate, were elected Members.

Mr. Cooper exhibited a series of *Taniocampa populeti*, Fb., bred from eggs laid by a specimen said to have been taken at Rannoch. Mr. Tugwell said that the specimens did not differ from the southern form of the species, and Mr. Carrington remarked that the same form was taken in Yorkshire. Mr. Adye showed a long series of *Asphalia ridens*, Fb., from the New Forest. Mr. Fremlin, varieties of *Vanessa urticae*, L., picked from 3500 specimens bred by him last season; in some of the specimens the variation was in the shading of the colour of the wings, in others, in the size of the two spots of the superior-wings and in the duplication of the spots, and many in the absence of the pigment, these last, Mr. Fremlin remarked, emerged with crumpled wings and died within a few hours. Mr. T. B. Billups, a large number of British spiders mounted on card. Mr. J. T. Carrington contributed a paper, "British Spiders."

May 9th, 1889.—The President in the Chair.

Mr. Tugwell exhibited *Tephrosia biundularia*, Bork., showing marked variation, all bred from a specimen taken at Tilgate Forest, in May, 1886; also bred series of the spring and summer broods of *Tephrosia crepuscularia*, Hb., from the same locality. Mr. Adye, a light form of *Catocala promissa*, Esp. Mr. Moore, two larvæ of a species of *Sphinx* from the West Indies. Mr. R. Adkin, a series of *Nyssia hispidaria*, Fb., from the New Forest, where it had been fairly common. Mr. Watson also exhibited this species from West Wickham. Mr. South exhibited a long series of *Noctua brunnea*, Fb., from various localities; also *N. Dahlii*, Hb., *N. festiva*, Hb., and var. *conflua*, Tr. Mr. South said that in 1886 and 1887 he obtained large numbers of the larvæ of *N. brunnea* from North Devon, which were feeding on bilberry and a species of wood rush, he found that although the larvæ differed in colour very considerably, yet they were very constant in the markings; he then, at some length, pointed out the different forms of variation of *brunnea* in his exhibit, and that in some cases *brunnea* so closely approached *Dahlii*, that he had a difficulty in saying which was which, and he was of opinion that the relationship between *brunnea* and *Dahlii* was the same as that between *festiva* and *conflua*. Mr. Tutt and Mr. Adkin exhibited specimens in connection with the subject. A discussion ensued, Messrs. Tutt, Adkin, Tugwell, Carrington, and others taking part. Mr. Billups exhibited a series of *Bembidium testaceum*, Duft., Chobham, 1888; also a large quantity of a species of *Oribatida*, which was causing an immense amount of mischief to cornchandlers by feeding on the crushed oats.—H. W. BARKER, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON: May 1st, 1889.—FREDERICK DU-CANE GODMAN, Esq., M.A., F.R.S., Vice-President, in the Chair.

Mr. Walter F. H. Blandford, B.A., of Trinity College, Cambridge, and 48, Wimpole Street, W.; and Mr. John W. Downing, of 59, Lupus Street, St. George's Square, S.W., were elected Fellows.

Mr. W. L. Distant announced the death of Dr. Signoret, of Paris, one of the Honorary Fellows of the Society.

Dr. Sharp exhibited male and female specimens of an abnormal form of *Rhomborhina japonica*, found in Japan by Mr. G. Lewis. They exhibited a contraction of the thorax, which was much narrower than usual at the base, so that the mesothoracic epimera were entirely exposed. Dr. Sharp also exhibited a small collection of *Coleoptera* made by Dr. N. Manders in the Shan States, Upper Burmah; this collection contained several new interesting forms, the most remarkable being a small Heteromorous insect bearing a considerable resemblance to *Rhysodes*. Amongst the specimens was an example of *Batocera Roylei*, which Dr. Sharp had retained in a relaxed condition, so that the Fellows might have an opportunity of hearing its stridulation; this was produced in a very audible manner by the base of the prothorax passing backwards and forwards over a striated space at the base of the scutellum.

Mr. C. O. Waterhouse exhibited, for Mr. Frohawk, a series of wings of British Butterflies, prepared in accordance with a process (described by Mr. Waterhouse in the Proc. Ent. Soc., 1887, p. xxiii), by which they were denuded of their scales so as to expose the neuration.

Dr. P. B. Mason exhibited nests of a species of spider, *Theridion pallens*, Black., from Cannock Chase, distinguished by the presence of large blunt processes on their surface.

Mr. H. Goss exhibited, for Mr. N. F. Dobrée, a number of galls of *Coccidæ*, picked off trees of *Acacia melanoxydon* and *Grevillea robusta*, imported Australian plants, growing in the Market Square, Natal. These galls had been referred to Mr. J. W. Douglas, who expressed an opinion that they belonged to the Fam. *Brachysecelidæ*, and probably to the genus *Brachysecelis*, Schrader. He said that most of the species lived on *Eucalyptus*.

Mr. H. J. Elwes exhibited a long and varied series of *Terias Hecabe*. He remarked that all the specimens which had strongly defined chocolate markings were taken in the cold and dry season, and that those which were without, or almost without, markings, were taken in the hot and wet season. Mr. Elwes further observed that he believed that many specimens which had been described as distinct were merely seasonal forms of this variable species. Mr. W. L. Distant, Mr. F. D. Godman, Prof. Meldola, Mr. H. T. Stainton, and Mr. G. Lewis took part in the discussion which ensued.

Mr. W. Dannatt exhibited specimens of *Thaumantis Howqua*, West., from Shanghai.

Mr. H. Burns exhibited, and made remarks on, a number of nests of living ants of the following species, viz.: *Formica fusca*, *Lasius alienus*, *L. flavus*, *L. niger*, *Myrmica ruginodis*, *M. scabrinodis*, &c. One of the nests contained a queen of *L. flavus* which had been in the exhibitor's possession since September, 1882.

Mr. G. C. Bignell communicated a paper entitled "Description of a new species of British *Ichneumonidæ*."

Mr. A. G. Butler communicated a paper entitled "A few words in reply to Mr. Elwes' statements respecting the incorporation of the Zeller Collection with the General Collection of *Lepidoptera* in the Natural History Museum." Mr. Elwes, Mr. Stainton, Mr. Godman, and others took part in the discussion which ensued.—H. GOSS and W. W. FOWLER, *Hon. Secs.*

FERTILE EGGS LAID BY WORKERS OF *LEPTOTHORAX*
TUBERUM, F.

BY J. E. FLETCHER, F.E.S.

The occurrence detailed below should have been recorded some time since, but my attention has been wholly occupied in other ways.

At the beginning of April, 1887, I chipped off a bit of bark from a scrubby old maple, exposing to view a nest of *Leptothorax tuberum*. As I had never obtained the ♂, nor seen a winged ♀, the thought occurred to me to take home the creatures, and try to obtain those forms in domestication. Some of the workers were got into a tin box, and when the ♀ was espied I tried to tilt her in also; but, owing to the extreme roughness of the bark and some projecting shoots just below the nest, she must have been tilted to one side, and to the ground. Anyhow, a close examination of the contents of the box at home showed that I had failed to secure her. Not requiring the workers as specimens, nor liking to turn them adrift, I elected to try how long I could maintain them alive, and to observe their conduct; never dreaming what would be the final result.

I took a piece of a young willow bole and stood it up in a large flower-pot two-thirds full of earth, placing a layer of moss on the earth. The whole was covered with fine gauze, made cylinder-shaped, capable of being closely tied below the rim of the pot, and held from the bole by an arrangement of wire. Upon a cracked part of the willow bark I pinned a few bits of mossy bark, and placed the ants on the bole; on the moss covering the soil I placed bits of shred beef, morsels of bread, jam, and moist sugar. Shortly afterwards, I was pleased to see the creatures taking up their abode under the bits of bark arranged for them, where they continued to reside to the end. Ripe raspberries, gooseberries, &c., were put in for them later on, and they were frequently seen visiting the several edibles.

Late in July, seeing they were seldom foraging, I unpinned a part of the nest, and was much astonished to see a number of larvæ, upon and around which the ants were gathered. Three weeks later I again peeped into the nest, and was gratified by seeing several cocoons.

Little was seen of the ants till the last third of September, when I one day saw a minute winged insect within the top of the gauze covering, which proved to be a ♂ ant; the next day several more appeared, and two others on the third day—twenty-one in all. During this, the workers were hurrying about, peering in all directions, often

ascending to more elevated positions to look out. They continued thus for two or three days, afterwards becoming more sluggish, and finally disappearing altogether. In the beginning of October I overhauled the contents of the cage, and found the ants, then reduced to seven, huddled together in the nest, and showing few signs of vitality.

Worcester: June, 1889.

NOTES ON SOME BRITISH AND EXOTIC COCCIDÆ (No. 14).

BY J. W. DOUGLAS, F.E.S.

DACTYLOPIUS ADONIDUM.

Coccus adonidum (Linn. ?), nec Geoffr., nec Burm.

Dactylopius adonidum, Sign., Ess. Cochen., 340, i, pl. xvi, figs. 1, 1a—1d; Comst., Report for 1880, p. 341, pl. xi, figs. 1—1d.

Dactylopius longispinus, Targ.-Tozz., Studii s. Coccin. (1867), pl. i, figs. 1—5.

♂. Dingy yellow-brown, head, thorax, antennæ and legs fuscous; antennæ of ten joints, set with fine, short, projecting hairs; 1st joint short, stout; 2nd longer, stouter, bulbous; 3rd longest of all, thinner, nearly cylindrical, tapering downwards; 10th nearly or quite as long, fusiform; 8th and 9th shorter, subequal; 4th to 7th still shorter. Wings long, broad, dark smoky-grey, iridescent. Halteres yellowish, long, with a recurved terminal seta. Two anal filaments long, white. Legs long; tarsi broad, pubescent, digitules fine, short, the terminal knob very small; claw long and slender.

Length, 1 mm.; exp. of wings, 2½ mm.

♀ adult. Long-oval, dingy yellowish or livid, but appearing white by reason of a close covering of fine mealy powder; segments distinctly visible, on the upper-side of those of the thorax with several deep punctures, those of the abdomen deeply incised at their divisions, their surfaces thus becoming prominent, and the covering powder appears in larger granules; on the middle of the body longitudinally is a broad, brown or livid band-like shade, usually depressed. All round the exterior margin of the body is a fringe of long, distinct, narrow, setaceous projections, pointing obliquely backwards, each tapering to a long point, fourteen on each side, exclusive of four at the extremity, much longer and very fine, of which the outer pair are about three-fourths the length of the body, the inner pair twice as long (or more) as the outer, all covered with white powder. In the ultimate stage, just before the eggs are laid, the lateral projections are wider apart, and shorter, and stand out nearly at a right angle; the caudal filaments are also shorter, the shortening in both cases being caused by abrasion. Legs long; tibiæ twice as long as the tarsi; claw stout, long; digitules thin, terminal knob small.

Length, 3—3½ mm.; breadth, 2 mm.

Larva in both sexes of like form to the adult female, but smaller, yellower, and having the lateral and caudal setæ relatively, and sometimes absolutely, longer. The males have seven joints in the antennæ, the females only six.

In the "Fauna Succica," 1st ed., p. 341, No. 1169 (1746), Linné quotes a pre-

vious description of his own in Act. Ups., 1736, p. 37, No. 8, "*Pediculus hybernaculorum arboreus villosus*," and describes *Pediculus adonidum* in terms subsequently used in the "Systema Naturæ" (c.f. *infra*), but adding here the words, "An *Chermes* vel *Aphis*? os enim non examinavi." This species is omitted in the "F. S. Editio altera," doubtless because it was seen not to be a *Pediculus*, but it re-appears in the S. N. as *Coccus adonidum*.

In his "Hist. abr. Ins.," i, 511, i (1764), Geoffroy described both sexes of *Coccus adonidum*, citing the *Pediculus adonidum* of Linné as synonymous, and stating that Linné had so designated it generically on account of its resemblance to a woodlouse, and because he did not know the male sex. Of the male he says that the two wings and the four filaments of its tail are *snow-white*; of the latter two are long and the other two a little shorter. The female does not differ appreciably from the description by Linné (see below), except that no mention is made of the raised, longitudinal, dorsal line and the punctures; but these discrepancies, and the want of a description by Linné, make it doubtful if the species in both cases was the same.

In the "Syst. Nat.," p. 740, 4 (1767), Linné describes his *Coccus adonidum* as follows, citing his *Pediculus adonidum* and *Coccus adonidum*, Geoffr., as synonyms: "C. rufa farinacea pilosa. Corpus ovatum, longiusculum, album. Linea dorsalis longitudinalis, elevata, cum puncto obsoleto in singulo segmento. Laterum margines acuti cum incisuris 14, totidemque punctis prominentibus. Area inter lineam dorsalem marginemque totidem punctis in seriem longitudinalem dispositis. Cauda bifida. Antennæ capillares fuscae. Pedes 6, tenues, fusci. Senior factus folliculum struit, se ipsa sexies majorem, intra quem insimul ova flava includit."

The male, except in the quotation from Geoffroy, "alis setisque niveis," is not alluded to.

Shaw, in his "General Zoology," vi, p. 189 (1806), gives a brief and imperfect description of *Coccus adonidum*, in which he states that the male is rose-coloured, somewhat mealy, with semitransparent milk-white wings, and four long filaments at the tail; the female presents no specific character. This may possibly be the same species as Geoffroy's.

Burmeister (Handbuch, ii, i, p. 74, Taf. 2, fig. 2 ♂, 10 ♀), describes *Coccus adonidum* thus:—"Aurantiacus, undique farinosus, ♂ halteribus instructis, setis caudalibus pubescentibus; ♀ elliptica, utrinque fimbriata, setis caudalibus crassis, corpore triplo brevioribus.

Long., ♀, $1\frac{1}{4}'''$, ♂, $1\frac{1}{2}'''$."

According to the synonyms quoted, this purports to be the *C. adonidum* of Linn., Fab., Geoffr., and Bouché. As far as the ♂ is concerned it does not agree in the colour of the wings, given by Geoffroy as "snow-white," and by Shaw as "milk-white;" and as regards the ♀ it differs from the description of Linné and all other authors, in stating that the caudal setæ are thick and shorter than the body (the figure represents them as one-third of its length, and the lateral projections short, broad, and rounded at the end).

Targioni-Tozzetti, in his "Studii sulle Cocciniglie" (1867), p. 9, says, "The genus *Dactylopius* contains two species generally confused under the name of *Coccus adonidum*;" he does not discriminate nor describe them, but, on Tav. i, figs. 1—5, he figures what is stated (p. 75) to be "*D. longispinus* (*C. adonidum*, Auct.)." This

seems to be understood by Signoret (p. 341) to represent *his adonidum*. In his "Catalogus" (1868), p. 32, Targioni has "1, *Dactylopius longispinus*, nob. (Studii s. Coccinig., 1867) ; 2, *D. adonidum*, nob., n. sp.," but there is no indication what the latter is.

Signoret (*l. c.*) describes a *Dactylopius* which he found on a *Musa* in the hothouses of the Luxembourg, and which he takes to be the type of *C. adonidum*, Linn., but the female, which was the only sex described by Linné, differs in that it has not the raised dorsal line with lateral rows of punctures; and the male having grey wings, cannot be identical with the *C. adonidum* of Geoffroy, which has snow-white wings, and which was accepted by Linné for his species. I think it would have been better if Signoret had ignored altogether the doubtful, discordant or unrecognisable descriptions or figures of previous authors, and had adopted a new name, rather than to have given an old name to a virtually new species. But as this action has been or is likely to be followed by others, it would only tend to greater confusion now to stickle for the proper course.

My description agrees very well with that of Signoret, and I think refers to his species, but there is this exception, that he, referring to the antenna of the ♂, says (p. 309), that his fig. 1*b* represents it, and that the 3rd joint is as long as the 8th, but this is a *lapsus calami*, for as a fact the figure shows that it is the 10th and not the 8th that equals the 3rd, and this is what I find in my examples.

The various species known as *Coccus adonidum* had been introduced into Europe with plants imported from hot climates before the time of Linné; Geoffroy says, "the hothouses of the Jardin du Roi at Paris were full of these insects." In Britain they have also been long naturalized and known, under the name of "mealy bugs," as destructive to exotic plants in hothouses.

In his "General Zoology," p. 189, Shaw says that they then (1806) were common, and injurious to plants in stoves; and Haworth, "Trans. Ent. Soc.," i, 308 (1812), says of *C. adonidum*, "Habitat in hortorum caldariis arboribus variis, pestis vulgatissima eximia."

Signoret (*op. cit.*) enumerates 18 species of *Dactylopius* as living on plants protected under glass or in the open air of the South of France; and although it is certain that some species live indiscriminately on various plants, yet Signoret says, p. 351, that each kind of plant, especially when brought from different countries, may certainly furnish species different to those which have passed as *C. adonidum*, and be special to the plant; therefore, a special study of exotic plants would be sure to result in the discovery of new species.

On stove plants sent to me from time to time I have occasionally found a few individual specimens of this species; but in January, 1888, I received from Mr. R. Irwin Lynch, Curator of the Botanic Garden, Cambridge, some leaves of *Anthurium regale*, *Pothos aurea*, and *Cycas circinalis*, all thickly infested, on the under-side, with this *Dactylopius* in all stages of existence—fully developed females and their eggs enveloped in a mass of excreted cottony matter, and every grade also more or less surrounded with the cottony material and exuviae; in a few small cottony sacs were males about to be perfected, and among them three fully developed; nearly all the insects preferred the shelter of the ribs of the leaf.

DACTYLOPIUS THEOBROMÆ, n. sp.



♀ adult. Broad-short-oval, slightly narrow in front, tumid, pale yellowish, antennæ and legs concolorous; body on the upper surface covered with fine white powder, but leaving the segmentation visible; margin with short hairs and a series of long, subconical, granular, white projections all round; anal processes evident, rounded; hairs of anal ring normal, caudal setæ (denuded) very fine, short. Antennæ short, of eight joints (fig.); 1st very stout, not short; 2nd and 3rd longer, in length subequal, strong, but each consecutively thinner; 4th shortest of all; 5th and 6th each a trifle longer than 4th, subequal; 7th a trifle longer than 6th; 8th pointed, longest of all, equal to 5th, 6th, and 7th together; all with fine projecting hairs, the terminal ones on 8th longest. Legs strong, with few projecting hairs; tarsi half the length of tibiæ; claw short; digitules of tarsi and claws long, very fine. Length, 3 mm.

Male unknown to me.

On the 30th April last Mr. R. T. Lewis sent me a specimen of this species, one of three which he had just previously found on *Theobroma cacao* in the gardens of the Royal Botanic Society. The insect lived for several days and exuded a large quantity of loose, flossy matter, enveloping the end of the body and extending to more than twice its length; in this a large quantity of oval, yellow eggs were deposited. The insect has the *prima facie* aspect of a *Pseudococcus*, but the antennæ having only eight joints, and there being four digitules on the tarsi and claws, it must be referred to *Dactylopius*, of which genus it appears to be an undescribed species.

The figure of the antenna is transferred from a drawing by Mr. R. T. Lewis.

8, Beaufort Gardens, Lewisham:

May, 1889.

HAS ANY ONE LATELY BRED *GELECHIA* (*LAMPROTES*)
ATRELLA?

A QUERY PROPOUNDED BY H. T. STANTON, F.R.S.

The larvæ of this insect were first detected as far back as the year 1866, by Mr. W. R. Jeffrey, then living at Saffron Walden.

The larvæ were burrowing down the stems of *Hypericum*, and the result of their thus burrowing was that the upper parts of the plant drooped, and, so to speak, "hung out flags of distress." This to the observant entomological eye is an unfailing sign that something is there at work.

Mr. Jeffrey kindly forwarded me some of these larvæ, which I duly noted at the time in the Entomologist's Annual for 1867, pp. 21—23, and he also sent me bred specimens of the imago.

I was so much under the impression, from the general appearance of *Gelechia atrella*, that it, like so many of its allies, must feed on some plant of the Order *Leguminosæ*, that I was not at all disposed, at first, to concede that these *atrella* could really have fed upon the *Hypericum*, and I even propounded the question whether some larvæ feeding on one of the *Leguminosæ* had not been accidentally introduced into the breeding-cage.

This suggestion of mine was, however, met with tolerably conclusive evidence that no such devourer of *Leguminosæ* had found its way into the breeding-cage, and that I must really accept the stubborn fact that the specimens of *Gelechia atrella* bred had positively come from the stems of *Hypericum*.

On further reflection, I consoled myself with the idea that if the larva had fed on a different plant, or in a different way from what I should have anticipated, the new information I had acquired was the more interesting and valuable.

Mr. Jeffrey remarked in 1866, that he had been unable to detect any pupæ, whence, he presumed, they underwent their change inside the stems. On my suggesting that the dead stems should be examined, to see if the empty pupa-skins were really there, I learnt that the old stems had been unfortunately thrown away, so that the discovery of the very peculiar mode of pupation of this insect remained to be made at a later date.

In August, 1867, in a box of insects sent to me for determination by the Hon. T. De Grey (now Lord Walsingham), I found a fine specimen of *Gelechia atrella*, so fine that I suspected it must have been bred. On enquiring the history of this specimen I received the

reply already quoted in this Magazine, vol. vi, p. 36, but which, as many of my readers may, perhaps, not have that volume at hand, I reproduce here:—

“*Gelechia atrella*.—I bred from a brown cocoon obtained by sweeping, in June, amongst grass in Buckinghamshire. There was much *Hypericum* in the place, and it may have been attached either to this or to the long grass. The cocoon was flexible and rather flat, and I much doubted if it were occupied, until the insect emerged in the glass pill-box, where I had put it.”

In May, 1869, the same kind friend sent me several stems of *Hypericum*, which were tenanted by these larvæ. As the plant began to wither before the larvæ were fed up, it was necessary to supply them with fresh food, and it was needful also to extract the larvæ from the old stems, a troublesome piece of work, and not unattended with danger to the larvæ, as I fear I squashed three of them in the process. But I had at least three or four others alive and healthy, which I turned on to the fresh plants, into the stems of which they eventually bored, ejecting their “frass” either at the summit of the stem (where I had cut off the tops, thinking thereby to facilitate their entrance), or at the sides.

On examining these *Hypericum* stems at the end of May, 1869, to see how the larvæ were getting on, I found to my surprise two brown flat cases, nearly half an inch long, each evidently formed of a piece of *Hypericum* stem, cut off by the larva for its pupal domicile.

The description I gave of these in 1869 was that they “were not unlike the new-fashioned spectacle cases, which are rather limp and open at both ends,” and I remarked that had I found one of these cases at large, I should have taken it for the case of an *Adela* or *Nemotois* larva.

The brown flat case, formed of a piece of the excavated *Hypericum* stem, within which the larva of *Gelechia atrella* assumes the pupa state, was also duly recorded in the Entomologists’ Annual for 1870, p. 9.

In the foregoing pages I have said little but what I had already given some twenty years ago, either in this Magazine or in the Entomologist’s Annual, but the point to which I wish to call the reader’s attention is this: that during those twenty years, so far as published records are concerned, though many people have met with the perfect insect, no one ever seems to have come across the larva, or to have bred the imago.

I search in vain through the pages of all the latest writers on this

group of insects, but only to find:—"Die Raupe nach Stainton im Mai in den Stielen von *Hypericum*."

Any one would think from this, I had discovered the larva, whereas I have only recorded the observations made first by Mr. W. R. Jeffrey, and secondly by Lord Walsingham, and I have no wish to have undue credit forced upon me. Moreover, I may confess that I had imagined that the notice given of the larva and its habits would have enabled any energetic collector to find it.

In the south of France, another *Gelechia* larva burrowing in stems of *Hypericum* has been detected by Lord Walsingham, "having exactly the same habits as those of *Gelechia atrella*, but failing to make the same 'spectacle-case' cocoon."

May there not be yet other species with somewhat similar habits? the mine is probably not exhausted.

Mountsfield, Lewisham, S.E. :

June 14th, 1889.

NOTES ON DR. JORDAN'S ENTOMOLOGICAL RAMBLE AT BERGEN, NORWAY, AUGUST 20TH, 1887.

BY W. M. SCHÖYEN,

Conservator at the Zoological Museum of the University of Christiania.

In vol. xxiv of this Magazine there are two separate contributions to the Lepidopterous Fauna of Norway, viz.: "An Entomological Ramble at Bergen, Norway, August 20th, 1887," by Dr. Robert C. R. Jordan, pp. 127—130; and "Notes on some Norwegian Crambi," by Mr. G. T. Baker, pp. 267, 268.

Concerning the latter, which is based, likewise, on Dr. Jordan's captures in this country, I have but little to say, but, in Dr. Jordan's article, there are several errors which need to be corrected, and I must therefore beg space for a few remarks on some of his determinations of the species captured or observed by him.

Mr. Baker is, no doubt, right when he says, at the beginning of his article, that, "comparatively speaking, but little is known of the Scandinavian Insect-Fauna amongst the majority of British Entomologists," but there is certainly no reason why this should be so, were only the British Entomologists as much interested in the knowledge of our Scandinavian, as we are in that of their British Fauna.

Then, with regard to most orders of our insects, there are publications both of older and more recent date, so that any one wishing to obtain special information on these matters could readily do so.

And it may, perhaps, be advisable that those who contemplate giving notes on the Fauna of a foreign country, should first make themselves conversant with the publications already existing where essential information might be obtained. This would often prevent the premature publication of hasty notes based upon cursory observations of hypothetical species, which really do not occur in the locality of which the writer is treating.

As for the Lepidopterous Fauna of Bergen, where Dr. Jordan's "Ramble" was made, my friend J. Sp. Schneider, now Conservator at the Museum of Tromsø, who lived many years in Bergen, has given a list of his captures there in "Christiana Vid. Selsk. Forhandl.," 1875; and a list of all the *Lepidoptera* observed at Bergen may be found in H. Siebke's "Enumeratio Insect. Norveg.," Fasc. iii, 1876, edited by Schneider.

Dr. Jordan records, as the result of his excursion on that "glorious day in August," 12 species of *Lepidoptera*, 5 *Rhopalocera*: *Vanessa urticæ*, *Erebia Blandina*, *Chionobas Jutta* (all three seen only, not captured), *Lycæna Icarus* and *Pararge Hiera* (both of them captured); 4 *Geometræ*: *Larentia didymata*, *cæsiata*, *Cidaria populata*, *Ortholitha limitata*; and 3 *Micro-Lepidoptera*: *Ablabia pratana*, *Simæthis Fabriciana* and *Mimæseoptilus fuscodactylus*.

The first butterfly observed was *Vanessa urticæ*, thus mentioned "a splendid specimen, small, and clearly enough of the dark Northern form *polaris*." Unfortunately the true var. *polaris* does not occur near Bergen. My friend Schneider, who collected and observed butterflies for many years at Bergen, never saw any var. *polaris* among the *Vanessa urticæ* flying there; nor have I myself anywhere observed this variety out of the arctic region, not even on Dovrefjeld, where only a connecting link with the true arctic form can be found.

No doubt, in comparison with English specimens of *V. urticæ*, those in Norway are somewhat smaller and darker, but the true var. *polaris* (nigricans, macula dorsali cum macula costali conjuncta) only occurs in the arctic region of our country.

The second butterfly observed by Dr. Jordan he calls *Erebia Blandina*, an insect which, though occurring in England and Scotland, has never yet been found in any part of Scandinavia, either in Sweden or in Norway. What Dr. Jordan did see was doubtless *Erebia Ligea*, a species which, though not occurring in England, is more or less common over the greater part of Norway, and precisely in the month of August, flies near Bergen.

The third butterfly observed, which Dr. Jordan names *Chionobas Jutta*, adding that it "settled on a slab of rock as usual," was, I have no doubt, *Satyrus Semele*, which, in August, flies commonly on the rocks at Bergen, whereas *Chionobas Jutta* has never been found there. *Jutta*, moreover, does not fly on rocks or stony ground, but exclusively on moors, amongst fir trees, on the stems of which it chiefly settles. When Dr. Jordan further speaks of having taken *Chionobas Jutta* at Jerkin, Dovrefjeld, and compares its habit with that of the alpine *Chionobas Aello*, he has again, without doubt, confounded *Chionobas Norna*, which is the species of Dovrefjeld, with *Jutta*. This last named species has, up to the present time, not been found there, though many Entomologists, both Norwegian and from foreign countries, have, at different times, collected very assiduously in that interesting locality.

The fourth butterfly mentioned by Dr. Jordan, which he not only observed, but actually caught, he calls "*Pararge Hiera*, a small dark and beautiful specimen." Yet I have no hesitation in saying that again he has wrongly determined the species, as *Pararge Hiera* is never on the wing at that date (August 20th); it is an early species, only to be found in May and June, or, perhaps, a few worn and weather-beaten specimens in July. I have no doubt that what Dr. Jordan did take was a ♂ *Pararge Mæra*, which species flies just at that time on the cliff-sides at Bergen and elsewhere in our country, and of which the males are generally both small and dark-coloured, so that they may be easily confounded with *Hiera* by an observer who has not had much experience of the two species.

The fifth butterfly mentioned, *Lycæna Icarus*, is common throughout Norway, and is, no doubt, rightly named.

The *Geometræ* and *Micro-Lepidoptera* mentioned are common species, and have nearly all been already observed in the same locality. As for *Platyptilus Fischeri*, mentioned also by Dr. Jordan at p. 42 of the same volume, "common as far north as Throndhjem in Norway," I may state that this species is common much further north, and even occurs in Finmark at 70° latitude.

Mr. Baker's notes on the *Crambi* collected by Dr. Jordan are of more interest, as the determinations of the specimens do not arouse my suspicions as to their correctness.

The only point which strikes me is that *Crambus cerussellus* (one ♀) is said to have been taken at Throndhjem, as this species had not been observed further north than Christiania. As for *Crambus truncatellus*

found at Tönset,* and supposed by Mr. Baker to be a new species for Norway, I must call attention to the fact that Boheman first detected this species on Dovrefjeld, 1832. In 1887 I have myself taken it both on Dovrefjeld and in Gudbrandsdal, and, in 1884, in Snaasen, northern Throndhjem, Amt.

The other species mentioned are all more or less common in several districts of Norway, though some of the localities are new.

Christiania, Norway:

April 20th, 1889.

Notes on Agrypnia Pagetana and other Trichoptera.—On the 7th instant, a very hot and sultry day, I met with *Agrypnia Pagetana* in great numbers at Hogganfield Loch, near Glasgow (about 250 feet above sea level). This loch is almost overrun with *Anacharis canadensis*, and the insects were crawling over the carpet which this plant forms, or resting on horse-tails after short flights. In about an hour (between 1 and 2 p.m.), almost without moving from one spot, I easily captured twenty specimens. Judging from their conduct, and the condition of the examples taken, I think the insects were just emerging. If I am right, then the species under notice differs in this respect from some of the *Phryganeidæ*; for example, *Phryganea striata*, the imagos of which I have often seen developed about sunset. While most of the members of this family have a nocturnal flight, I think *P. obsoleta*, at least, flies voluntarily in the hot sunshine about the margins of its breeding places. Whether *Agrypnia Pagetana* normally possesses the latter habit, I am not yet quite certain, but most probably it does. The only other species noticed at Hogganfield were also *Phryganeidæ*, viz.: *Phryganea striata* and *P. obsoleta*.

In the Carluke district, *Trichoptera* are appearing early, and in force. Species rarely observed before the second week in June under ordinary circumstances, have been out for some time. Of *Stenophylax vibex*, always a rare insect, I have already seen more specimens this season than in several previous years' collecting. A fine ♂ came the other night to a lighted window; another ♂, almost intact, was found in a spider's web, and two other caddis-flies found in the same position were pretty certainly the same species, but too mutilated for positive identification.—KENNETH J. MORTON, Carluke, N.B.: June 10th, 1889.

Ravages of Cecidomyia (Diplosis) pyrivora, Riley.—There were notices of this insect last year (Ent. Mo. Mag., xxiv, pp. 273, 274, and Riley's "Report of the American Entomologist," for 1883, pp. 283—289). The pears I now send are beginning to shrink, from the drought and heat in part, and in part because their vitality is destroyed by the larvæ, and in a few days they will turn black. The larvæ leave the pears and fall to the ground; they have great saltatory powers if placed on a plate. This year I find no Marie Louise pears affected, last year they were the

* Tönset—the name of this place is unfortunately misprinted Tuset at p. 263, vol. xxiv.—Eds.

most attacked. A week or ten days ago, the affected pears were much more conspicuous than now; they having shrunk, whereas the others have grown.—E. N. BLOOMFIELD, Guestling Rectory, Hastings: *May 31st*, 1889.

Migratory swarm of Libellula quadrimaculata at Dover.—On Thursday, June 6th, being informed that there was a flight of dragon-flies on the Admiralty Pier, I at once proceeded there, and found some hundreds of the above species flying round the middle of the pier.

I have witnessed extraordinary flights of this species in France, similar to the swarms observed by a gentleman at Malmö, in Sweden (Ent. Mo. Mag., vol. xx, p. 88), and although the swarm was small, I have never seen nor heard of one like the present one at Dover. The weather was dull and oppressively hot, with a slight wind from the N.E., and the dragon-flies appear to have come up with the storm-clouds from the sea in the south-westerly direction. The heavy rain and thunder-storm the same evening must have made havoc among them; however, hundreds were seen the next day, and a few on the 8th, but they have now entirely disappeared. They were very difficult to catch, owing to their rapid movements, and their habit of settling under the parapet on the outside of the pier. However, I succeeded in getting a dozen or two, and amongst them were varieties with a brownish cloud beneath the pterostigma, a similar cloud beneath the cubital spot, and in one example the sub-costal veins between the base and cubital spot slightly tinged with orange. The insects were confined to the vicinity of the pier, and were not observed in the town.—C. G. HALL, 14, Granville Street, Dover: *June 10th*, 1889.

[The variety noticed by Mr. Hall was formerly considered a distinct species—*L. prænubila*, Newm.,—and is always met with where the type-form is common.—R. McLACHLAN.]

Entomological notes from Colorado.—To my list of 27 species common to Europe and Colorado I can now add a few, viz.: *Eros Aurora*, W. Custer Co.; *Haliphus ruficollis*, Deg., West Cliff, 1889; *Vespa germanica*, Fab., W. Custer Co.; *Agrotis saucia*, Hb., W. Custer Co., frequent; *Plusia brassicæ*, Riley, which some regard as a form of *ni*, Hb., W. Custer Co., larva and imago; *Heliothis armigera*, Hb., and also its var., *umbrosa*, Grote, W. Custer Co., frequent. The insects are coming out in great force here now; the day before yesterday I took a ♂ and ♀ *Colias Eriphyle*, var. *autumnalis*, the first for this year. I am having wonderful success with the rose and willow galls: from five species of rose galls I have bred four Cynipids and thirteen Chalcids; and from three kinds of willow galls four Cecids, one sawfly, and seven Chalcids; galls referred to *Cecidomyia salicis-strobiloides* produce two distinct species of *Cecidomyia*, which are at once separated by the ♂ genitalia. Woolly galls on *Bigelovia*, which were long supposed Trypetid, and have always been a puzzle, have produced Cecids, provisionally called *Cecidomyia bigeloviæ*, as they are probably undescribed. Flat leaf-galls on *Rosa* have produced a presumably new Cynipid, *Rhodites rosafolii*; but all these will be examined more fully, and described later.—T. D. A. COCKERELL, West Cliff, Colorado: *May 25th*, 1889.

Heptaulacus villosus, Gyll., in profusion in Cobham Park, Kent.—Yesterday morning Dr. Sharp and I found this insect in profusion at the above-mentioned locality. Further details will be given next month.—J. J. WALKER, 23, Ranelagh Road, Sheerness : June 21st, 1889.

Coleoptera in North Devon.—The following species of *Coleoptera* were obtained by me last year in North Devon, in August and September. Some of them are of general interest, and an enumeration of the others may assist other entomologists visiting that county.

At Lynmouth *Coleoptera* are decidedly scarce. The district is sharply divided, for collecting purposes, into the valley of the Lynn, with its wooded combes, and the surrounding barren hills; from these few insects were to be obtained. Searching under stones produced *Amara patricia* and *Staphylinus stercorarius*, both of which are fairly common.

Of the species to be found in the Lynn Valley, *Hydræna pygmæa* is the most noteworthy; this, by repute a northern insect, occurs in a small hill-side rivulet on the Waters'-meet Road. It may be found sparingly on the under-side of stones, in company with *Elmis aneus* and *Hydræna gracilis*; this latter, however, another northern species, is rare, and I only secured two examples in several visits.

Dianous cærulescens and *Lesteva pubescens* are both common in the neighbourhood of this little stream.

Up the river valley there is much rotten wood, and in it *Pterostichus oblongopunctatus*, *Baptolinus alternans*, *Scaphidium quadrimaculatum*, *Scaphisoma agarinum*, and *Endomychus coccineus* are to be commonly found; I also took *Agathidium seminulum*, *Liodes humeralis* and *orbicularis*, and *Scaphisoma boleti*.

Rhopalomesites Tardii, abundant in one or two dead ash trees near the "Hunter's Inn," and *Strangalia quadrifasciata*, of which I took several examples on *Spiræa* up the Brendon River, are worth mention.

At Braunton Burrows I worked for coast and sand-hill species without success, being rewarded only with *Psammodytes sulcicollis*; the sand-hills yielded one extraordinary capture in a specimen of *Potaminus substriatus*, which was basking in the sun about a mile from the nearest fresh water. There had evidently been a large immigration of water-beetles, as *Parnus auriculatus* also turned up, and some of the common *Helophori* were in swarms on the coarse grass. *Gymnetron villosulus* and *Rhinoncus inconspectus* and *bruchoides* are also worth mentioning.

In the canal leading to the village of Braunton, I found a small flock of *Gyrini*, one of which, taken with an umbrella in the absence of a net, proved to be *G. urinator*. After this I hunted for it regularly, with the proper implement, and was rewarded with one specimen out of several hundred common examples; so it does not abound at Braunton.

The marshes, on the land side of the burrows, simply swarm with beetles, among which I took *Meligethes exilis*; and in the corner of one field *Cassida murræa*, *viridis*, *vibex*, *equestris*, and *hemisphærica*; both the green and the brown forms of *C. murræa* were very common.—W. F. H. BLANDFORD, 48, Wimpole Street, W. : May 15th, 1889.

Gyrinus minutus in the South.—Having mentioned *G. urinator* in my previous note, I may add that in 1882 I found this species in abundance in a pool on Studland Heath, near Swanage, about a mile from the sea.—ID.

Pentarthrum Huttoni, Woll., at Plymouth.—This interesting little Coleopteron occurs in a *Cossus*-infested white poplar in this neighbourhood. I discovered the habitat in the spring of 1888, but did not publish the fact at that time. Having again taken the insect at the same place, on May 4th of the present year, however, I send this note of the capture at the suggestion of Mr. J. J. Walker, R.N., who was with me at the time. *Homalota cinnamomea*, *Mycetæa hirta*, *Abræus globosus*, *Dorcus parallelipedus*, *Soronia punctatissima*, *Tachinus rufipes* and *Phratora cavifrons* were also obtained from the same tree.—I. H. KEYS, 8, Princess Street, Plymouth: June, 1889.

Coleoptera at South Brent.—Among captures of lesser note, I found the following beetles during a fortnight's visit to the locality last summer, *Corymbites metallicus*, *Larinus carlinæ*, *Orobitis cyaneus*, and *Elaphrus uliginosus*.—ID.

Coleoptera in the Hastings district.—The following are among the best species taken by me in the Hastings district last year. At Guestling, in nests of *F. rufa*; *Dinarda Märkeli*, *Monotoma augusticollis*, and *Thiasophila angulata*. Amongst *F. fuliginosa*, *Myrmedonia funesta* and *laticollis*, not uncommon, and a single specimen of *Homæusa acuminata*. Under bark, I found *Homalium brevicorne* (1) and *punctipenne* (common); a single specimen of *H. gracilicorne* in May blossoms. Other species taken at Guestling by general sweeping and beating, &c., include: *Euplectus piceus*, *Xylophilus populneus* (2), *Tychius venustus*, *Atomaria nigripennis*, *Ancyrophorus longipennis* (1), *Aspidiphorus orbiculatus*, *Choleva velox* and *anisotomoides*, *Agathidium rotundatum*, *Mycetoporus lucidus* (1), and *Attelabus curculionoides* (4). At Camber I got *Harpalus serripes* (not uncommon), *Saprinus maritimus*, *Anthicus instabilis*, *Bledius unicornis*, in profusion, and *B. tricornis* (rare), and with these I took *Dyschirius salinus* (a few). By evening sweeping, at Ore, I found *Colon brunneum*, *Anisotoma badia*, *Colenis dentipes*, *Hydnobius strigosus* (2), and *Proteinus atomarius* (1). At the same place, by shaking tufts, &c., I got *Mniophila muscorum*, *Erirehinus costirostris* (2), and a few specimens of *Helophorus nanus* in a small pond. I have also taken *Ochthebius rufomarginatus*, *Phlæophora reptans*, *Quedius lateralis*, *Homalota cinnamomea*, *Trachyphlaeus squamulatus*, *Corylophus sublævipennis*, *Haliplus confinis* and *cinereus*, *Aphodius porcus*, *Platystethus nodifrons*, and *Corticaria serrata*.—W. H. BENNETT, 11, George Street, Hastings: June, 1889.

Lopus sulcatus at Torcross.—On a visit to Torcross, which adjoins Slapton-lea, I found last year *Lopus sulcatus*, and Mr. Douglas suggested that I should take notice of the food-plant on my next visit and capture. On the 8th inst., I was at the locality, and again found the insect, four specimens on *Senecio vulgaris*, four on *Chenopodium ficifolium*, and five on *Anthyllis vulneraria*, all growing in isolated patches; I feel certain that I did not take the species on either of these plants last year; I, therefore, presume that it is a general feeder.—G. C. BIGNELL, Stonehouse, Plymouth: June 12th, 1889.

Reviews.

BEITRÄGE ZUR KENNTNISS DER SCHWEIZERISCHEN TRICHOPTEREN : by FR. RIS. Mittheilungen der schweizerischen entomologischen Gesellschaft, Band 8, pp. 102—145 (also separately, 43 pp.). 1889.

A CONTRIBUTION TOWARDS A CATALOGUE OF THE NEUROPTEROUS FAUNA OF IRELAND : by JAMES J. F. X. KING. Transactions of the Natural History Society of Glasgow, vol. ii, pp. 259—292 (also separately, 38 pp.). 1889.

It is refreshing to find so much energy devoted to the working out of local Neuropterology. Local lists, some original, some revisional, have been lately appearing to an extent we scarcely anticipated a few years ago.

M. Ris, one of the most astute and critical workers on European *Trichoptera*, gives us a revisional List of the Swiss Caddis-flies; revisional, because it supplements and corrects the List published by the late M. Meyer-Dür in 1882, which latter supplemented an earlier work by the same author in 1874. M. Ris now raises the number of known Swiss *Trichoptera* to 225 species (including several indicated, but not described, species of *Hydroptilidæ* that are, perhaps, new). There is probably no other country in Europe that could show such a List, with the exception of France; but such a comparison would be unfair to Switzerland. We think M. Ris recognises the apparent impossibility of reducing *Trichoptera* to synoptical tables on the plan of the "Fauna insectorum helvetiæ" now in course of publication in the "Mittheilungen." His local information is very full, and there are many biological notes of great value, such, for instance, as the remarks on larvæ believed to be those of *Rhyacophila tristis*, tending to show Pictet was right when he asserted that the external branchial tufts usual in the larvæ of *Rhyacophila* may be wanting in some species of the genus as it now stands.

In noticing Mr. King's Irish Catalogue we cannot do better than quote his words at p. 291 : " This List is designed as a first attempt to supply an outline of the local distribution of an Order of Insects, which, in Ireland at least, has hitherto been almost wholly neglected. If it should awaken fresh interest and stimulate further investigation, the objects designed by its publication will have been fully attained."

Mr. King's List embraces the whole of the Linnean *Neuroptera*; and the distribution of each species is given, according to the four provinces of the island, with more minute county details as regards the various localities quoted. It is not more than a List with localities, but will serve as a foundation upon which to extend information; and it is original to the extent that, with few exceptions, it is based upon the compiler's own experience and investigations. Mr. King enumerates 26 *Psocidæ*, 11 *Perlidæ*, 23 *Ephemeridæ*, 25 *Odonata*, 23 *Planipennia* and 103 *Trichoptera*, as Irish (a most remarkable feature is that no species of *Panorpidæ* is included), or 211 species as compared with 350 for the United Kingdom and 327 for Belgium. We once heard it said that in Irish local lists of insects, occasionally appearing in our pages, some species so generally common as not to be worth notice were included. Possibly; but, on the other hand, it must not be lost sight of that

the precise condition of the Irish insect-fauna, both numerically as to species, and locally as to distribution, is still less known, in most orders, than that of many a foreign country.

Other local Lists of *Neuroptera* are in preparation, and of these we hope to say something hereafter.

RÉPERTOIRE ALPHABÉTIQUE des noms spécifiques admis ou proposés dans la SOUS-FAMILLE DES LIBELLULINES, avec indications bibliographiques, iconographiques, et géographiques: par ALFRED PREUDHOMME DE BORRE; royal 8vo, 58 pp. Bruxelles, F. Hayez. 1889.

The thanks of the small number of entomologists who occupy themselves with Dragon-flies are due to M. de Borre for his laborious compilation. The sub-family *Libellulina* is one of the most difficult and less known of all Dragon-flies. The list is alphabetical from beginning to end, the synonyms printed in italics. With each species is the name of the modern genus or sub-genus to which it has been referred. We find as nearly as possible 500 species or named varieties indicated; but a certain proportion are only catalogue or collection names, which might have been omitted with advantage: but the compiler gives apologetic reasons for their retention. The List cannot fail to prove of the greatest advantage to workers. On two points we think it might have been improved and its utility increased, viz.: by the addition of the *date* when each name was first given, and by a List of genera or sub-genera, though these are comparatively few and still in a transitional state.

BIRMINGHAM ENTOMOLOGICAL SOCIETY: *May 20th*, 1889.—Mr. W. G. BLATCH, President, in the Chair.

Mr. Blatch exhibited *Hypulus quercinus*, from Hopwas Wood, which he said had not been recorded in the district before. Mr. J. F. Perry exhibited *Coleoptera* from San Remo. Mr. Geo. H. Kenrick exhibited *Arctia Caja* in all stages, ova, larvæ of two generations, pupæ and imagines, all of which were produced from one batch of eggs laid last year. Mr. Lee exhibited a melanic variety of *Odontopera bidentata* from Cannock Chase. Mr. C. J. Wainwright showed *Endromis versicolora* from Wyre Forest.

June 3rd, 1889.—The President in the Chair.

Rev. E. D. Roberts, of Handsworth, was elected a Member.

Mr. H. Tunaley exhibited ova and larvæ of *Lobophora viretata*, obtained by sleeving captured impregnated females on the twigs of holly; where there were blossoms the eggs were laid upon them, where there were none they were laid on the young leaves. A considerable number of ova were obtained, which hatched in about seven days. He failed to get the insects to pair in captivity. Mr. Perry exhibited *Coleoptera*, including *Anisotoma cinnamomea* and *Melasis buprestoides*, both from Sutton, and new to the Birmingham district. Mr. H. M. Lee exhibited a red variety of *Smerinthus tilia*. Mr. R. C. Bradley exhibited a number of species of *Lithocolletis* and read notes on the genus.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY,
May 23rd, 1889.—T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Mr. Tugwell exhibited *Acidalia aversata*, L., bred from a strongly-banded grey form, the only examples bred were specimens of a rich ochreous-brown banded form, and the var. *spoliata*, Staud. Mr. Tutt, long series of *Cidaria truncata*, Hufn., and *C. immanata*, Haw., also *Tephrosia crepuscularia*, Hb., and *T. biundularia*, Bork., and made some observations on the last two species. Mr. South, long series of *Hypsipetes sordidata*, Fab., comprising examples of the species from various English and Scotch localities, also of *Larentia didymata*, L., and read notes relative to his exhibit. Mr. White, *Hymenoptera* collected in the neighbourhood of Colchester. Mr. Billups, a series of *Banchus variegator*, Fab., bred from *Panolis piniperda*, Panz., a large female specimen of *Ophion luteum*, Fab., bred from *Dicranura vinula*, L., also the following *Coleoptera*: *Lithocharis piceus*, Kr., *Actobius signaticornis*, Rey, and *A. villosulus*, Steph., taken at Lewisham. Mr. Carrington contributed notes on collecting at Horseley. Mr. W. White read a paper, "Observation v. Collecting."

June 13th, 1889.—J. T. CARRINGTON, Esq., F.L.S., Vice-President, in the Chair.

Mr. H. Moore exhibited species of *Lepidoptera* from Antigua. Mr. Wellman, bred specimens of *Macroglossa fuciformis*, L., and *Nemeobius Lucina*, L., also living larvæ of *Halia vauaria*, L., showing variation. Mr. Helps, *Selenia tetralunaria*, Hufn. Mr. Robson, specimens of *Sesia formiciformis*, Esp., with yellow bands. Mr. South, long and varied series of *Cidaria truncata*, Hufn., and *C. immanata*, Haw., from various localities, and referred to the first-named species as having been honoured with no less than eight names. Seeing how variable the species was the multiplicity of trivial names was hardly matter for surprise, but few, if any, of the Entomologists of the present day were inclined to claim specific rank for the forms now so generally admitted to be aberrations of *C. truncata*. Regarding *C. immanata*, this species was not so deeply involved in the synonymic web as the previous one. Mr. South then proceeded to describe the various named forms of both species, and illustrated his remarks by the specimens in his exhibit. Mr. Tugwell made some remarks on collecting during the present season.—H. W. BARKER, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON: *June 5th*, 1889.—The Right Hon. LORD WALSHINGHAM, M.A., F.R.S., President, in the Chair.

Mr. W. M. Christy, of Watgate, Emsworth, was elected a Fellow of the Society.

Mr. S. Stevens exhibited a specimen of *Acrolepis assectella*, Zeller, included in a lot of *Tineidæ* purchased by him at the sale of the late Mr. A. F. Sheppard's collection, and determined by Mr. Stainton. He also exhibited, for comparison, a specimen of *A. betuletella*.

Mr. J. J. Walker, R.N., exhibited a collection of *Lepidoptera* made in 1887 and 1888 in the immediate vicinity of the Straits of Gibraltar. The collection included

sixty-eight species of butterflies, of which thirty-six were obtained on the Rock of Gibraltar itself, and the remainder on the European side of the Straits, and about one hundred and sixty species of moths.

Dr. P. B. Mason exhibited a number of specimens of a South European species of ant—*Crematogaster scutellaris*, Oliv. He said that the specimens were all taken in the fernery of Mr. Baxter, of Burton-on-Trent, and had probably been imported with cork.

Mr. O. E. Janson exhibited a pair of *Neptunides Stanleyi*, a species of *Cetoniidæ*, recently received from Central Africa, and described by him in the February number of "The Entomologist;" also some varieties of *N. polychrous*, Thoms., from the Zanzibar district.

Dr. N. Manders exhibited a number of *Lepidoptera* collected by himself in the Shan States, Burmah; also a collection of *Lepidoptera* made by Captain Raikes in Kárenni.

Mr. McLachlan exhibited over 400 specimens of *Neuroptera*, being a portion of the collection formed in Japan by Mr. H. J. S. Pryer. They represented nearly all groups (excepting *Odonata*, now in the hands of Baron De Selys). Some of the *Ascalaphidæ*, *Panorpidæ*, and especially *Trichoptera*, were of great beauty; notably amongst the latter was the curious moth-like genus *Perissoneura*, McLach.

Dr. Sharp exhibited the peculiar cocoons of an Indian moth, *Rhodia Newara*, Moore; these were the cocoons possessing a drain at the bottom in order to allow water to escape, already described in the "Proceedings of the Zoological Society" for 1888, p. 120, where, however, their great resemblance to the pods of a plant had not been alluded to.

Mr. Enock exhibited, and made remarks on, specimens of *Cecidomyia destructor*, bred from American wheat.

Mr. W. Warren exhibited a bred specimen of *Retinia posticana*, Zett., from Newmarket; also specimens of *Eupithecia jasionæata* and *Gelechia confinis*, bred by Mr. Gardner, of Hartlepool.

Mr. C. O. Waterhouse exhibited and explained a number of diagrams, illustrative of the external characters of the eyes of insects. A discussion ensued, in which Mr. McLachlan, Mr. Verrall, Lord Walsingham, Mr. Jacoby, Mr. Kirby, and others took part.

Mr. A. G. Butler communicated a paper entitled "Descriptions of some new *Lepidoptera-Heterocera* in the collection of the Hon. Walter de Rothschild." He also contributed a second paper entitled "Synonymic Notes on the Moths of the earlier genera of *Noctuites*."

Dr. Sharp read a paper entitled "An Account of Prof. Plateau's Experiments on the Vision of Insects." Lord Walsingham, Mr. Jacoby, Mr. White and Mr. Waterhouse took part in the discussion which ensued.—H. Goss, *Hon. Secretary*.

ON THE BRITISH SPECIES OF THE GENUS *ANASPIS*, GEOFFROY,
WITH DESCRIPTION OF A NEW SPECIES.

BY THE REV. CANON FOWLER, M.A., F.L.S.

The *Mordellidæ* may be regarded as divided naturally into two tribes, the *Mordellina* and the *Anaspina*: the former of these is characterized by having the anterior coxæ broadly distant at base, and the pygidium produced into a more or less strong style; whereas, in the latter, the anterior coxæ are almost contiguous at the base, and the pygidium is not produced into a style. The genus *Anaspis*, which contains the great majority of the members of the tribe *Anaspina*, comprises about seventy species, of which about forty are found in Europe, and nearly all the remainder in North America and Northern Asia; as, however, one species has also been described from the Australian region, it is probable that the genus is much more extensive and more widely spread than is at present known.

The species are small and very delicately made insects, and are found in flowers or by sweeping herbage; certain species abound in the blossoms of the hawthorn in May and early June, and, in fact, it is almost impossible on a warm sunny day to find a tree in bloom on which they are not abundant. The British species are usually considered to be eight in number, but we evidently possess two if not three more, and probably others may yet be discovered. They are variable in colour, and some of them are easily distinguished; the unicolorous black group, however, is well known as presenting great difficulties.

As I have recently been giving some attention to the genus for my work on the "British *Coleoptera*," and have found it one of the most difficult, in some respects, of all that I have yet worked out, I thought that it might be of advantage to publish my conclusions in the Entomologist's Monthly Magazine, in the hope that other Coleopterists who have taken an interest in the genus may be able to correct or add anything to them.

The chief differences lie in the formation of the joints of the antennæ, and particularly in the appendages or "laciniaë" of the third ventral segment of the male; the sculpture also is slightly variable, but this does not afford any striking characteristic. In certain species the colour is important, but in others it may prove very misleading; for instance, *A. ruficollis* is marked by having the head black or pitchy-black and the thorax red, but there appears to be a continental variety with the head red. Specimens of *A. frontalis* are also found on the continent with the front and sides of the thorax yellow.

I have, as will be seen, added a new species, *A. Garneysi*. Dr. Power took a considerable number of specimens, and they have for a long time been separated off in his collection as *A. variegata*, but he never described them; as, however, there is already a *Mordelistaena variegata*, it seems best to adopt another name.

The British species may be tabulated as follows:—

I. Thorax black.

i. Elytra black, unicolorous.

1. Antennæ longer, with joints 6—10 increasing gradually in length, not moniliform.

A. Intermediate and posterior femora entirely, or almost entirely, black.

a. Forehead, in part at least, yellow; size larger; apical appendages of third ventral segment in male narrow, curved inwards towards apex, but not widely separated...

A. frontalis, L.

b. Forehead black; size smaller; apical appendages of third ventral segment in male narrow and parallel...

A. pulicaria, Costa (*forcipata*, Muls.).

B. Intermediate femora entirely, and posterior femora almost entirely, yellow; apical appendages of third ventral segment in male short and stout and strongly curved inwards, enclosing an almost circular space..... *A. Garneysi*, n. sp.

2. Antennæ shorter, with joints 6—9 subglobose in the male and submoniliform in the female, of about equal size, scarcely as long as broad or transverse.

A. Average size larger; last joint of antennæ proportionately shorter; male with two linear appendages reaching from the third to the fifth ventral segment of abdomen... *A. rufilabris*, Gyll.

B. Average size smaller; last joint of antennæ proportionately longer; male without appendages to the third ventral segment of abdomen *A. melanostoma*, Costa (*monilicornis*, Muls.).

ii. Elytra black, with a bright yellow patch at each shoulder; antennæ long, not moniliform..... *A. Geoffroyi*, Müll.

II. Thorax red or testaceous.

i. Antennæ longer, with the penultimate joints longer than broad, at all events in the male.

1. Elytra and head black *A. ruficollis*, F.

2. Elytra and head testaceous or brownish-testaceous, the latter sometimes darker towards apex and base *A. subtestacea*, Steph.

ii. Antennæ shorter, with the penultimate joints moniliform, transverse or subtransverse in both sexes; head reddish-yellow or testaceous.

1. Elytra variable in colour, blackish or brownish, but without spots...

A. flava, L., v. *thoracica*, L.

2. Elytra very light testaceous with obscure dark spots

A. maculata, Fourc.

A. FRONTALIS, L. (*assimilis*, Snell.).

Elongate, subfusiform, black, clothed with very fine fuscous-grey silky pu-

bescence, with the base of the antennæ, front of head, and the anterior legs, except more or less of upper margin, yellow or reddish-yellow; the whole of the coxæ are often more or less ferruginous; head very finely punctured, antennæ rather long, with joints 6—10 gradually increasing in length and not moniliform; thorax not much broader than long, narrowed in front, with the posterior angles almost right angles, sculpture very fine; elytra transversely strigose, the sculpture being distinct, but finer than in the allied species, and much stronger than that of thorax; tibial spurs testaceous.

Length, $2\frac{3}{4}$ —4 mm.

Male with the antennæ longer than in female, the anterior tarsi with the first joint transverse, slightly dilated, and the second and third joints oblong, strongly dilated; the third ventral segment of the abdomen is narrowly emarginate in the middle, and is furnished with two narrow lacinix or appendages, which are approximate at base, and gradually diverge and curve inwards towards each other at apex; these appendages almost reach the apex of the abdomen.

Female with the antennæ slightly thickened towards apex, abdomen simple.

On flowers of whitethorn, by sweeping among grass, &c.; common and generally distributed throughout the kingdom.

The yellow colour of the front of the head is variable, extending sometimes over a greater and sometimes over a lesser extent of surface; a variety occurs on the continent (*A. lateralis*, F., *nec* Thoms.), in which the yellow colour extends to the front and sides of thorax; I have not, however, seen any British examples.

A. GARNEYSI, *n. sp.*

In size, shape and general appearance closely resembling *A. frontalis*, from which it may be known by the somewhat longer and more slender antennæ and more evident sculpture, which is intermediate between that of *A. frontalis* and *A. rustilabris*; the legs also are differently coloured, the anterior pair being pale yellow, with the exception of the apex of the femora, which is dusky above; the intermediate and posterior femora are also entirely, or almost entirely, yellow, the tibiae being more or less variegated, and the tarsi fuscous; the antennæ are long and slender, with the joints much longer than broad; the thorax is scarcely broader at base than its length from base to apex; the chief difference, however, lies in the male characters; in this sex the third segment is much elongated, and is furnished with two rather stout and widely separated appendages, which are strongly curved inwards towards one another, and enclose between them an almost circular, smooth and shining space; their appendages reach quite to the apex or extend a little beyond it; the anterior tarsi are not strongly dilated.

Length, $2\frac{3}{4}$ —3½ mm.

On flowers, &c.; taken in some numbers by Dr. Power at Ditton, Horsell, Cowley and Claygate (Esher), and set aside by him as a new species, but never, apparently described. As, however, there is already a *Mordellistena variegata*, F., I have, in order to avoid confusion, adopted a new name, and called it after the late Mr. W. Garneys, a mutual friend of Dr. Power and myself, to whom I owe the fact that I ever studied *Coleoptera* at all.

The only species I can find which may be compared with this one is *A. nigripes*, Brisout, which also has the ventral appendages in the male strongly divergent and convex, but in this species, as its name implies, the legs are entirely (or almost entirely) black, the thorax is shorter, and the appendages narrower.

A. PULICARIA, Costa (*forcipata*, Muls.).

Smaller than any of the other black species ; in general appearance resembling a small *A. frontalis*, from which it may be known by its lesser size and the characters of the male, in which sex the appendages of the third segment are rather stout, straight and parallel, and not curved inwards towards one another at apex ; the male characters and the darker legs (the anterior pair alone being mostly yellow and the rest black) will distinguish it from *A. Garneysi*, and the finer sculpture and less moniliform antennæ will separate it from *A. rufilabris*. Length, $1\frac{1}{2}$ — $2\frac{3}{4}$ mm.

On flowers, &c. ; locally common—Shirley, Mickleham, Esher, Darenth Wood, Chatham, Chingford, Dulwich, West Wickham, Cowley, &c. ; Dover ; Hastings ; Brockenhurst ; Glanvilles Wootton ; South Wales ; Needwood, near Burton-on-Trent ; Repton ; Northumberland district, Wallington. The species has probably been overlooked in many localities, and most likely has been confounded with small specimens of the allied species.

A. RUFILABRIS, Gyll. (*atra*, F., *s. g. NASIPA*, Emery).

Elongate, subfusiform, black or pitchy-black, clothed with brownish or greyish silky pubescence, with the labrum, base of antennæ and tibial spurs, testaceous, and the greater part of the anterior legs, and the posterior pairs in part, rufescent or pitchy ; antennæ short, moniliform, more strongly so in male than in female ; thorax about one-third broader than long, evidently strigose, especially at sides, with the posterior angles somewhat acute ; elytra distinctly and comparatively strongly strigose transversely ; in some specimens the legs are black or nearly black, and in others the greater part of the head and sides of thorax are pitchy, or appear to be sometimes even reddish. Length, $2\frac{1}{2}$ — $3\frac{1}{4}$ mm.

Male with the anterior tarsi with the first joint transverse, slightly dilated, and the second and third joints strongly dilated, and with the third ventral segment of the abdomen furnished in middle with two nearly straight appendages, approximate at base, and slightly divergent behind, not reaching the apex of abdomen.

On flowers, &c. ; occasionally by beating dead twigs ; local, but not uncommon in many districts, although, apparently, often overlooked ; Darenth Wood, Leith Hill, Mickleham, Cowley ; Portsea ; New Forest ; Glanvilles Wootton, Dorset ; Sutton Park and Solihull, near Birmingham ; Repton, Bretby Wood (on wild cherry blossom) ; Dunham Park, Manchester ; Northumberland and Durham district, Wallington, and several other localities ; Scotland (common in flowers), Solway, Tay, Dee, Moray, and probably other districts ; it is probably not uncommon in Ireland.

This species much resembles *A. frontalis*, but may be known by its shorter and stouter moniliform antennæ, and evidently stronger sculpture, as well as by the straighter and narrower appendages of the third ventral segment in the male.

A. MELANOSTOMA, Costa (*monilicornis*, Muls., *s. g.*, *NASIPA*, Emery).

Very like the preceding, but less elongate, and distinguished by having the thorax not or scarcely strigose, and the sculpture of the elytra very obsolete, as well as by the fact that the third ventral segment of the abdomen in the male bears no lacinia, being simple as in the female; the antennæ are rather stout and moniliform, with the second joint small, and joints 5—10 subtransverse; the thorax, moreover, is shorter than in *A. rufilabris*, and has the posterior angles less acute and more nearly right angles; the formation of the antennæ and the absence of ventral appendages in the male will separate it from *A. frontalis*; the colour of the legs is somewhat variable; the male may be known by having the fifth ventral segment split to base, and the anterior tarsi dilated.

Length, $2\frac{1}{2}$ —3 mm.

On flowers, &c.; one specimen in Dr. Power's collection, taken at Darenth Wood on June 3rd, 1860. Many years ago Mr. Crotch expressed it as his opinion that it would occur in Britain; it appears to be found in most of the districts of France, and is rare, according to Thomson, in Norway and Sweden. It is very likely not uncommon in the south of Britain, and may have been passed over partly through its likeness to *A. frontalis*, and partly owing to the difficulty of determination occasioned by the absence of the appendages in the male; the split 5th segment of the abdomen is, however, a good character. Mr. Crotch considers Thomson's characters of the nearly smooth thorax and obsoletely strigose elytra to require further confirmation, and adds, as an additional character to separate it from *A. rufilabris* (derived apparently from Mulsant, Longipèdes, p. 88), the fact that the first joint of the anterior tarsi is equal to the second, whereas, in the last-named species it is much shorter.

A. GEOFFROYI, Müll.

(*fasciata*, Forst., *humeralis*, F., *biguttata*, Rossi).

Black, with a large bright yellow patch at each shoulder, which varies in size, and sometimes covers the greater part of the elytra; occasionally there is a small spot also behind the middle of each elytron; the pubescence is more scanty than is usually the case in the species belonging to the genus; antennæ long, somewhat thickened towards apex, not moniliform, black, with the base yellow, mouth and palpi yellow; thorax transverse, very finely sculptured; elytra very finely and closely strigose transversely; legs variable, dark or more or less testaceous.

Length, $2\frac{1}{2}$ —3 mm.

Male without appendages at the apex of the third ventral segment of the abdomen, and with the fourth segment produced in the middle behind, and the fifth deeply cleft; anterior tarsi moderately dilated.

On flowers ; local, and not uncommon in some districts ; London district, rather common, Darenth Wood, Mickleham, Penge, Ripley, Forest Hill, Dulwich, Chingford, West Wickham, Chatham, Sheerness, &c. ; Dover ; Hastings ; Portsea ; New Forest ; Glanvilles Wootton ; Bristol ; Swansea ; Hertford ; Cambridge ; Norfolk ; Suffolk ; Midland districts, generally distributed ; Lincoln ; Whitby ; Manchester ; Northumberland and Durham district, rare, but widely distributed ; Scotland, not common, Solway, Tweed, Forth, and probably other districts.

A. RUFICOLLIS, F.

Black, thickly clothed with silky, greyish pubescence, with the mouth parts, base of antennæ, thorax, and the greater part of the legs reddish-testaceous ; the tarsi, apex of tibiæ, and sometimes part of femora, are infuscate ; thorax broader than long, very finely strigose transversely ; elytra subparallel, bluntly rounded at apex, rather more strongly strigose than thorax ; the antennæ are longer in the male than in the female, and in both sexes are comparatively long ; in the latter the penultimate joints are as long as broad, and in the former they are evidently longer than broad ; the head is said to be occasionally rufous, but I have not observed this in any British specimen. Length, $2\frac{1}{2}$ — $3\frac{1}{4}$ mm.

Male with the third ventral segment of the abdomen strongly and broadly produced and narrowly emarginate at apex, with the appendages reaching the fifth segment and curved internally, fourth segment with two smaller appendages ; anterior tarsi scarcely dilated.

On flowers of whitethorn ; common and generally distributed throughout England and Wales, but probably less common towards the north, as it appears to be only occasional in Scotland, where it has hitherto occurred solely in the Solway and Forth districts ; Ireland, Dublin, Armagh, Belfast, and probably general.

A. FLAVA, L., v. THORACICA, L. (*flava*, Thoms., s. g. NASIPA, Emery).

Elongate, yellow or yellow-testaceous, with the apical portion of the antennæ, and the breast and abdomen, blackish or pitchy-black ; elytra variable (in our British specimens pitchy-black or pitchy yellow-brown) ; in the type form they are yellow, or yellow with the apex broadly or narrowly fuscous ; the legs also are variable in colour, being usually entirely yellow, but sometimes more or less fuscous, especially the posterior pair ; the antennæ are short, thickened towards apex, and with the penultimate joints distinctly moniliform ; the thorax is nearly as long as broad, very finely sculptured, with the posterior angles slightly obtuse ; the elytra are very finely, but distinctly, strigose transversely ; the upper surface is clothed with rather strong silky pubescence. Length, $2\frac{3}{4}$ — $3\frac{1}{4}$ mm.

Male with the abdomen without appendages, the fifth segment cleft, and the anterior tarsi dilated.

On flowers, &c. ; local, but somewhat widely distributed ; London district, not uncommon, Ripley (Surrey), Darenth Wood, Claygate (Esher) ; Thames Ditton ; New Forest ; Devon ; Birmingham district ; Repton ; Northumberland and Durham district, apparently rare ; Scotland, rare, Solway District.

As far as I know we only possess as British the variety *thoracica*, L., which has the head and thorax testaceous-yellow, and the elytra dark ; it much resembles at first sight *A. ruficollis*, but the latter species has the head black. The variety of the latter with the head red, which I have not seen as British, may be standing in some collections under *A. thoracica* ; if so, it may be known by its longer antennæ, which are not moniliform, shorter thorax, and the presence of appendages in the male ; it is also quite possible that the type, *A. flava*, may be found mixed with *A. subtestacea* ; the antennæ, however, of this latter species are much longer and not moniliform, with the penultimate joints distinctly longer than broad, and the male characters are different. Mulsant (Coléoptères de France, Longipèdes, pp. 110 & 113) causes still greater confusion by completely separating *A. thoracica* from *A. flava* on the ground that the former has the penultimate joints of the antennæ in the male distinctly longer than broad, and in the female scarcely (if at all) transverse ; it is obvious, therefore, that Mulsant's *A. thoracica* cannot be the same as the insect which we ordinarily consider as the *A. thoracica* of Linné, and that it stands, in fact, in the genus *Anaspis* proper, and not in the subgenus *Nasipa* of Emery, in which the latter author places *A. flava*. Emery (Essai Monographique sur les Mordellides, p. 21, L'Abeille, xiv) refers the *A. thoracica* of Mulsant, at all events in part, to *A. confusa*, a new species of his own ; this is very likely the true explanation of the difficulty, and as it is very probable that the species occurs in Britain (the localities given being Europe boréale et moyenne), it may perhaps be of service to append his description :—

A. confusa, Emery (*A. thoracica*, Muls., Longipèd., p. 110, *ex parte*, *A. lateralis*, Thoms., Skand. Coleop., vi, p. 302, ♂).

Black, silky, with the head, thorax, base of antennæ, and legs, rufo-testaceous, posterior femora usually fuscous ; thorax not one and a half times broader than long ; antennæ with the joints gradually and slightly narrowed towards apex, with the penultimate joints feebly subconical in the male and more distinctly so in the female.

Length, $2\frac{1}{3}$ — $3\frac{1}{3}$ mm.

Male with the third segment of the abdomen produced behind, with the appendages approximate and nearly straight at base, and slightly curved inwards at apex, passing beyond the apex of abdomen, fourth segment small, with less conspicuous, depressed, appendages, fifth segment foveolate, incised at apex.

M. Emery is also of opinion that a portion of Mulsant's *A. thoracica* may perhaps have to be referred to his *A. Costæ*, a species

of his subgenus *Nasipa*, which closely resembles *A. flava*, but differs in having the fourth segment of the abdomen in the male furnished with appendages which are longer than in any other species of *Anaspis*, and reach to the apex of the appendages of the third segment; it has also the thorax a little broader and the antennæ more evidently moniliform, but these are scarcely appreciable differences.

A. SUBTESTACEA, Steph.

Testaceous or fusco-testaceous, with the apex of the antennæ, or the whole of the antennæ, except base, and also the abdomen and sometimes base and apex of elytra, dark; occasionally the abdomen is in part, or wholly, testaceous; pubescence fine and rather close; antennæ rather long, not moniliform, with all the joints evidently longer than broad; thorax nearly as long as broad, very finely sculptured, posterior angles not obtuse, almost right angles; elytra rather long, somewhat pointed at apex, very finely strigose transversely, the sculpture being nearly as fine as on thorax; legs testaceous. Length, 3—3½ mm.

Male characters peculiar, the second ventral segment of the abdomen being furnished with two linear appendages, which are very long; from the apex of the third segment there arises a vertical plate, furnished with a tooth beneath, and divided behind into two lobes, which reach the apex of the fifth segment; the fourth segment bears two short appendages, and the fifth is deeply cleft and bilobed; the anterior tarsi are dilated.

On flowers, and by sweeping herbage; local, but not uncommon in many districts; London district rather common; Suffolk; Hastings; Glanvilles Wootton; Devon; South Wales; Tewkesbury; Birmingham district; Leicestershire; Repton; Dunham Park; Manchester; Northumberland and Durham District, rather uncommon; it has not apparently been found in Scotland or Ireland.

A. MACULATA, Fourc.

(*melanopa*, Forst., *obscura*, Marsh., *bipunctata*, Bon., *pallida*, Marsh.).

Pale testaceous, clothed with fine, silky, yellowish-grey pubescence, with the apex of the antennæ, breast and abdomen black; the scutellary region, a common sutural spot at apex, and a round or transverse patch on the disc of each elytron before middle, are more or less plainly fuscous; in some specimens the spots before middle are alone present (v. *bipunctata*, Bon.), and in others all the spots are absent (v. *pallida*, Marsh.); the antennæ are considerably thickened towards apex, with the penultimate joints moniliform and transverse or subtransverse; thorax a little broader than long, very finely sculptured, with the posterior angles almost right angles; elytra very closely and finely strigose transversely; legs pale testaceous.

Length, 2¼—3 mm.

Male with the anterior tarsi dilated, and with the third segment of the abdomen produced in middle, and furnished with two appendages, which are approximate, and reach the apex of the abdomen; fourth segment short, emarginate in middle; fifth segment foveolate in the middle and slightly emarginate at apex.

On flowers of whitethorn, &c.; it has also been bred from woody excrescences on the trunks of birch trees; common and generally distributed throughout the kingdom.

AGRIOTYPUS ARMATUS (WALKER), CURTIS:
ITS LIFE-HISTORY AND GEOGRAPHICAL DISTRIBUTION.

BY PROF. FR. KLAPÁLEK.



Fig. A.



Fig. B.



Fig. C.



Fig. D.



Fig. E.

HISTORICAL SKETCH.*

This most interesting species of *Ichneumonidae* was first found by Walker on the Clyde, near Lanark, and was described and delineated by Curtis in his "British Entomology," No. 389, in the year 1832. In the *Entom. Mag.*, 1835, vol. iii, p. 412, we learn from a short notice by Walker, that he observed the female of *Agriotypus* descending beneath the surface of the water, and remaining there for ten minutes; he asks whether it does not deposit its eggs in the aquatic larvæ of some Neuropterous insect? At this stage remained the knowledge of the habits of *Agriotypus* until the year 1857,† when von Siebold reared the insect from cases of *Trichostoma picicorne*, Pict. He described, in a short paper (*Ueber Agriotypus armatus in Trichostoma picicorne*, in *Amtl. Bericht. d. Versamml. d. Naturforscher in Carlsruhe*, 1858, p. 211), the cases which enclosed the parasite, and which were furnished with a long band-like appendage at their head end. The cases were sent to him by Dr. Kriechbaumer from Munich, and von Siebold himself found at the same locality many cases with larvæ and nymphs of *Aspatherium picicorne*, some of which included the parasite. The females of *Agriotypus* were found creeping on the stones in the water, and the males flying above the water.

In the following year (1858) E. Holmgren, not knowing the original description by Curtis, described the insect as *Crotopus abnormis* (*Öfvers. k. Vet. Acad. Forhandl.*, 1858, t. xv, p. 354). He gave some remarks as to its systematic position and a detailed description, but knew nothing of its development. His dimensions ($1\frac{3}{4}$ —2") are smaller than those given by Curtis. There can be little doubt as to the identity, but the habitat is peculiar. He says:—"Habitat in graminosis ad littora lacuum per Sueciam meridionalem rarius; scilicet in Scania (Munch af

* I am much obliged for many data respecting the more recent literature to Mr. McLachlan and Mr. Bridgman.

† Compare Westwood, *Introd.*, vol. ii, p. 142 (1840).

Rosenskjöld); in Smolandia ad Näsbyholm (Boheman); in Vestrogothia (Gyllenhal)." The species of *Silo* inhabit running water, and further information is necessary.

In a subsequent paper (Ueber *Agriotypus armatus*, Stettiner Ent. Zeit., 1861, pp. 59—61) von Siebold states that he had found the nymphs of *Agriotypus* also in the cases of *Odontocerum albicorne*, Scop., and suggests that they may perhaps belong to a larger species, which he would name *major*.

Kolenati, in his G. et Spec. Tr., pt. i, p. 21, mentions, also from Bohemia, the cases of *Aspatherium picicorne*, Kol., bearing the appendages, but he did not fully understand the phenomenon.

In the Verhandl. Wien. zool. bot. Ver., 1857, pp. 189, 190, is a notice from V. Kollar (Beitrag zur Kenntniss ueber die geographische Verbreitung des *Agriotypus armatus*, Walk.) in which the author states that he obtained from Kolenati some cases with the appendages from Bohemia, and that he also found in the collections under his care a female *Agriotypus* from Styria.

At a meeting of the Entom. Soc. of London (Trans. Ent. Soc. Lond., Ser. 3, vol. i, Proc., p. 170), Prof. Westwood exhibited cases of *Aspatherium picicorne* from Mentone, with the usual appendages, and said he had extracted a specimen of *Agriotypus armatus* from one of them.

In A. Dours' Catalogue Systématique des Hyménoptères de la France, p. 52, the author repeats the known fact that *Agriotypus* is a parasite of *Aspatherium picicorne*, and says:—"Cette Phryganide lorsqu'elle est habitée par le parasite se reconnaît à un appendice filiform qu'elle porte à sa partie caudale." I hope to show that the appendage is carried at the head end of the case.

A review of the literature on *Agriotypus* is given by Mr. E. A. Fitch in the Entomologist, vol. xvii, June, 1884.

My attention was called to the *Agriotypus* during the exploration of the rivers Divoká and Tichá Orlice in Eastern Bohemia, which I undertook with the help of the Committee for physical exploration of Bohemia, and especially with the aid of Dr. Ant. Frič, in July last year. I found agriotypized cases not only in both rivers above named, but also in many brooks and springs which flow into them. The cases belonged to *Silo pallipes*, and contained fully grown larvæ, or what I will name "subnymphs" of the parasite.

Arrived at home I revised all the materials collected on my journeys through Bohemia, and was happy to find very many agriotypized cases from various localities, and at different seasons.

In the second half of April this year, I made, especially for this purpose, a journey to Litomyshle in Eastern Bohemia, where I was sure to find the *Agriotypus*, and I came just at the time it was beginning to fly. April 22nd, when I came to the brook, was a very sunny and hot day. The *Agriotypus* was flying above the water and along the banks, and swarming in a manner like ants. I also observed a female descending a stem of grass beneath the water, in a place where

the brook was 25 cm. deep. I took many stones from the water, and found females of *Agriotypus* sitting on some of them. The agriotypized cases of *Silo nigricornis*, Pict., which I found there enclosed fully grown imagos, which had already cast off the pupal skin, and were ready to escape from the water, and rather rarely, fully developed nymphs.

As the imago of *Agriotypus armatus* (Fig. A) was so well described by Curtis, it would be useless to give any further description of it here; I will add only, that all my examples caught in Bohemia are much smaller than the type examples preserved in the collection of the Natural History Museum in London, many of them being only half as large.

The fully grown larva (Fig. D) is maggot-shaped, with a distinct chitinous head, which bears small

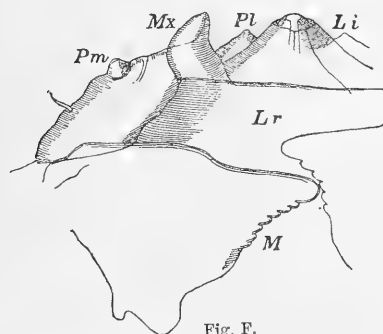


Fig. F.

simple eyes on the sides, but on which I could not detect the antennæ. The mouth parts (Fig. F) are biting and well developed; their general structure is not very unlike that of the jaws of a caterpillar. Labrum (*Lr*) membranous, very broad and short; mandibles (*M*) very strong and, if viewed from above, triangular, with a coarsely serrate cutting edge; maxillæ (*Mx*) rudimentary, their jaw parts membranous, and the palpi (*Pm*) are developed only as small warts; labium (*Li*) broad-conical, with a large opening of the salivary glands on its top, and with rudimentary wart-shaped palpi (*Pl*) on its sides. The thirteen segments of the body are soft with distinct divisions. They are of a very unequal breadth, so that the 1st—3rd increase gradually, the 4th and 5th are much smaller, the 6th—8th are broadest of all, the 9th—13th decrease again gradually in breadth. The last segment bears on its end two slender and adpressed hooks.

The larva, before changing into a nymph, assumes a new shape (Fig. C). The head is retracted into the following segments, the divisions of which become oblique; the head is now almost invisible. The anterior part of the body (segments 1—8) is cylindrical, with the front side straightly truncate; the following segments become gradually smaller, so that the posterior part of the body is acuminate. The hooks on the last segment are porrected. This is what I will call the subnymphal stage.

The nymph (Fig. B) is very similar to the imago ; it differs only in the shorter wings, and in the first abdominal segment being a little stouter.

The cases (Fig. E) of the host, when agriotypized, bear on their head end a long band-like appendage, spun of the secretions of the salivary glands. It is of a dark brown colour, and much exceeds the case itself in length, being, in *Silo pallipes*, 17 mm., and in *Silo nigricornis*, 26 mm. long and 1 mm. broad.

Von Siebold suggests that the larva of *Silo*, when infested, spins this appendage, and we find this opinion in all more recent books. It seemed somewhat curious to me that the larva, being exhausted by the parasite, should have such an amount of the material for spinning, and therefore I have examined a large number of agriotypized cases, and found the relations as they are indicated in the Fig. G. On each of the examined cases I found the normal covers of *Silo* ; a thin membrane anteriorly (v 1), to which is attached the stone which closes the mouth opening of the case, and posteriorly a strong membrane (w 1), furnished with the usual little holes. The larva or nymph of the parasite rests in a sort of cocoon (v 2 and w 2), whose sides are very closely connected with the sides of the case, and which leaves empty a little space of $1\frac{1}{2}$ mm. in the hind part of the case. To the anterior part of it is attached the appendage, which has been spun separately, and with its widened basis connected with the cocoon spun afterwards. The appendage penetrates through the membrane made by the larva of *Silo*, and arises between the wall of the case and the stone closing the mouth opening of the case. The chitinous remains of the larva of the host (s) lie in the empty hind part of the case. In cocoons enclosing the larvæ or subnymphs of the parasite there was resting on their posterior cover a ring of excrement (k), and in those enclosing a nymph (ag) also the cast skin of the larva (e). I believe then that the parasite allows the host-larva to prepare everything for changing into a nymph, to attach the case to stones and to close it, then devours it and forces the remains into the hind part of the case, makes the appendage, and finally spins the cocoon, in which it changes to the subnymph and afterwards into the nymph.

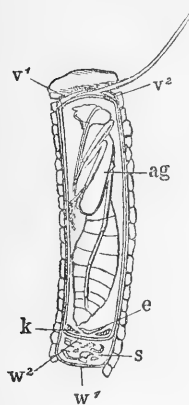


Fig. G.

With respect to the period of the whole life of *Agriotypus armatus*, I will enumerate here all my observations, and the localities in which I have found it, arranged according to the time of year.

April 22nd, 1889.—*Agriotypus* imago and fully developed nymphs; *Silo nigricornis* larvæ or very young nymphs. Found at Hrádek near Litomyshle.

June 8th, 1885.—One ♀ *Agriotypus* fully developed in a case of *Goëra pilosa*, F.; *Goëra pilosa* caught in the stage of imago, and also developed larvæ and young nymphs. Susihce in South-Western Bohemia.

June 30th, 1886.—*Agriotypus* in the stage of larvæ; *Silo nigricornis* as larvæ and nymphs. Hrádek.

Second part of July, 1888.—*Agriotypus* as larvæ and subnymphs; *Silo pallipes* almost as imago only. The rivers Tichá and Divoká Orlice in North-Eastern Bohemia.

September 17th, 1886.—*Agriotypus* in the nymphal stage. Nedoshin near Litomyshle.

September 20th, 1886. — *Agriotypus* in the nymphal stage. Hrádek.

It is, I think, evident from this series, that there is only one generation of *Agriotypus* in each year. The imago lives from April to June; the female lays its eggs on the cases of the host; it lives as larva till the end of July, or a little longer; changes into the subnymph stage; and in September it is grown to a fully developed and already dark coloured nymph. In this stage *Agriotypus* remains during the winter.

The species I have observed to be infested with *Agriotypus* are *Silo nigricornis*, Pict., *Silo pallipes*, F., and in one case *Goëra pilosa*, F. I have found as yet no agriotypized cases of *Odontocerum albicorne*, Scop., but it is quite possible that this species of *Leptoceridæ*, though less allied to *Silo*, does suffer by this parasite; it lives in the same waters, and most commonly in company with *Silo* and *Goëra*.

Agriotypus has been noticed as yet in the following countries:—in Scotland by Walker, in France as mentioned by Westwood, in Bavaria by Dr. Kriechbaumer and Von Siebold, in Styria by Oberl. Kroftschick, in Bohemia by Kolenati and myself, and in Southern Sweden in three different localities (Holmgren). I believe that it will be found very common.

EXPLANATION OF FIGURES.

A, *Agriotypus armatus*, ♀ imago; B, nymph; C, subnymph; D, larva (all $\times 6$); E, an agriotypized case of *Silo nigricornis* (nat. size); F, mouth parts of larva of *Agriotypus* ($\times 175$); G, section cut through an agriotypized case of *Silo nigricornis* ($\times 3$).

NEUROPTERA COLLECTED BY MR. J. J. WALKER, R.N., ON BOTH SIDES OF THE STRAITS OF GIBRALTAR.

BY ROBERT McLACHLAN, F.R.S., &c.

My friend Mr. Walker, then of H.M.S. "Grappler," was so kind as to collect such *Neuroptera* as came to his notice during the time his vessel was on the Gibraltar station. An enumeration, so far as I have been able to determine them, is given below.

So far as Gibraltar and its immediate vicinity is concerned, I think the only previous records of *Neuroptera* are those given by Brauer in the "Reise der Novara," *Neuroptera* (1865), who enumerates the following, viz., *Calamoceras marsupus* (a remarkable new genus and species of *Trichoptera*), *Chrysopa vulgaris*, Schnd., *Ch. tenella*, Schnd., *Nemoptera lusitanica*, Leach, *Calopteryx hæmorrhoidalis*, V. d. Lind., *Platynemis acutipennis*, Selys, *Gomphus simillimus*, Selys, and *Onychogomphus forcipatus*, L. It will be observed that several species are here included that were not met with by Mr. Walker.

With regard to the opposite coast, there are records of *Neuroptera* in the old authors, from Linné downwards, such as "*Habitat in Barbaria*," a vague term at the present time. The only recent record that I can recall is contained in a paper by Kolbe—" *Neuroptera aus Marocco, gesammelt von Herrn Prem.-Lieut. M. Quedenfeldt*"—published in the Berlin. ent. Zeitschrift, xxviii (1884), pp. 132—136, the materials for which were principally from Tangier. He enumerates *Libella nitidinervis*, Selys, *Hemianax ephippiger*, Burm., *Ischnura maroccana** (*n. sp.*), *Creagris plumbeus*, Oliv., *Myrmeleon Quedenfeldtii** (*n. sp.*), *Palpares libelluloides*, L., and *P. hispanus*, Hagen. For many years I have possessed a few species taken by the late Mr. Trovey Blackmore at Tangier, which I have noticed below as intercalations amongst Mr. Walker's materials. I have also a few other species from Marocco, but from outside the limits of this paper.

As no one who is specially a Neuropterist has yet collected either at Gibraltar, or on the opposite coast, there can be no doubt that very much remains to be discovered.

I.—GIBRALTAR AND VICINITY.

PLANIPENNIA.

Panorpa meridionalis, Ramb.—San Roque, 19th March; 1 ♀. This specimen is small (expanse, 15 mm.), and all those I have seen from Spain and Portugal are smaller and less strongly marked than those from the French Pyrenees.

* Indicated only from Casablanca, and therefore not within my geographical limits.

N.B.—It would be interesting to know the approximate northern limit of this species in France. Rambur (p. 329) says “elle se rencontre aussi dans une grande partie de la France,” but he cites only southern districts, such as the Pyrenees, Limousin, &c. I possess it only from the Iberian Peninsula and the French Pyrenees.

Palpares hispanus, Hagen.—Gibraltar, 23rd June; San Roque, 13th July; Algeçiras, 4th and 6th June; 4 ♂, 2 ♀.

N.B.—*Vide* the notes appended to the species from Marocco, *infra*.

Creagris plumbeus, Oliv.—Gibraltar, 23rd June; 3 examples,

Creagris v-nigrum, Ramb.—Cork Woods, 14th July; 1 example.

Myrmecaelurus trigrammus, Pallas.—Gibraltar, 7th and 8th July; 1 ♂, 1 ♀.

Macronemurus appendiculatus, Latr.—San Roque and Cork Woods, 7th, 14th, and 19th July; 2 ♂, 1 ♀.

Macronemurus ? *sp.*—Gibraltar, 7th September; 1 example. I am obliged to leave this undetermined, and am not quite sure that it truly belongs to the genus. It is of small size, and remarkable for two approximate fine parallel median dusky lines on the pronotum.

Myrmeleon nemausiensis, Borkhausen.—Cork Woods, 7 July; 1 example. Notwithstanding some slight omissions in Borkhausen's original description (Scriba's Beiträge, ii, p. 162, pl. xi, fig. 6), which is not detailed, I feel sure this insect is that intended by him, and his figure gives a good idea of it, especially as regards the very narrow wings and the two blackish oblique streaks on the anterior. I possess the species also from Montpellier (the type was from Nîmes), Pyrenees, and the Island of Sardinia. It is also, I have little doubt, the same as *M. litturatum*, Oliv. (Encyc. Méthod., viii, p. 127), from the South of France, &c., and *M. variegatus*, Ramb. (p. 400), equally from the South of France; but it cannot be identical with *M. variegatus*, Klug (Symb. Phys., iv, pl. xxx, fig. 4), from Arabia, especially on account of the markings of the thorax and abdomen on the latter: Rambur's description was drawn up from the French example.* Costa's *M. variegatus* (Faun. Reg. Nap.) agrees much better with Klug's species according to his description and figure, and does not agree with the insect I refer to *M. nemausiensis*, Borkh.

There still exists much confusion amongst the smaller South European or Mediterranean *Myrmeleonidæ*. Some years ago I received

* I possess a small *Myrmeleon* from Wady Nash, in the Peninsula of Sinai, that appears to be certainly Klug's *variegatus*, and quite distinct from *nemausiensis*, Borkh.

from Brauer an insect from Spalato, labelled "*M. nemausiensis*," but it does not at all agree with my idea of Borkhausen's species. The markings of the head and thorax are different; the wings are broader and there is little trace of the two oblique lines on the anterior, and moreover, nearly all the transverse nervules are clouded, giving the wings a strongly irrorated appearance. I have since received several examples from Amasia in Asia Minor. It quite agrees with the short description of *M. irroratum*, Oliv. (Encyc. Méthod., viii, p. 127, nec Klug), and I have little doubt is that species.

Nemoptera bipennis, Illiger (*lusitanica*, Leach).—Gibraltar, 12th May; 4 ♂, 2 ♀.

Chrysopa nigropunctata, Ed. Pict.—Gibraltar, 4th August, 1 example, agreeing with a type from E. Pictet in my collection. The largest black points on the pronotum form two < > opposed. Whether it, and some other forms from Spain, be anything more than varieties of *flavifrons* (Brauer) is perhaps open to question.

ODONATA.

Sympetrum Fonscolombii, Selys.—Gibraltar, 9th October; 1 ♂.

Orthetrum nitidinervis, Selys.—Algeçiras, 4th June; 1 ♀.

Cordulegaster annulatus, Latr.—Gibraltar, 21st June; 1 ♂. This example may be referred to the var. *immaculifrons*, Selys, but there is an indication of the black transverse band at the top of the front.

Æschna affinis, V. d. Lind.—Algeçiras, 18th July; 1 ♀.

II.—OPPOSITE COAST OF MAROCCO.

PLANIPENNIA.

Palpares hispanus, Hagen.—Tangier, 10th and 13th September; 2 ♀: [also from the same place, *Blackmore*].

N.B.—Kolbe (Berl. ent. Zeitschr., xxviii, p. 135) gives the result of a critical examination of the inferior appendage of the ♂ of *hispanus* and *libelluloides*, referring especially to its broader form in *hispanus*. I find his definition to agree tolerably well with my examples, only I do not clearly grasp the words "gegen die Spitze leicht verbreitert" as applied to *hispanus*; yet the form is liable to be altered in drying, and especially if the examples have been subjected to pressure by having been placed in "papillottes." I have before me nearly thirty examples of *libelluloides*, ranging from the South of France eastward to Syria (the latter would be the var. *æschnoides*, Illig.). Also 14 examples of *hispanus*, all from Spain and Marocco.

From the *ensemble* of characters *hispanus* appears to differ from *libelluloides* in its broader and shorter wings, on which the dark markings are more pronounced, and the irrorations on the anterior more numerous. On the posterior the isolated rounded sub-basal spot is, on the whole, much larger (in *libelluloides* it is sometimes reduced to a mere point; it is usually largest in the small form known as *æschnoides*). Furthermore, the abdomen in *hispanus* appears to me shorter than in *libelluloides*, especially in the ♂; and in *hispanus* it is *broadly and transversely banded* with black, whereas in *libelluloides* it has black *longitudinal lines*, nevertheless, the two styles of markings may be considered modifications of one. This black transverse banding I hold as of great importance in separating the two, and it is constant and conspicuous, except in examples that have become discoloured by decomposition. But Kolbe's paper raises a difficulty. He had seen two pairs from Marocco, which he refers to *libelluloides* and *hispanus* respectively, on account of the inferior appendage of the ♂, and in the pair referred to *libelluloides* the wings are said to be appreciably broader and shorter than in those referred to *hispanus*; moreover, the markings of the abdomen are as in *hispanus*. Here I must leave the question. I do not possess *libelluloides* from Africa, and have seen no ♂ with short and broad wings and *banded* abdomen that I can refer to *libelluloides*. The species certainly occurs in north-eastern Africa (*cf.* Savigny, *Déscrip. de l'Égypte*; the figure probably indicates the slight variety known as *æschnoides*).

Formicaleo annulatus, Klug ?, Ramb. ?.—Benzus Bay, 25th July and 28th August; 2 examples. The determination is doubtful, but possible, especially as regards Rambur's species from Andalusia, the type of which no longer exists.

Macronemurus appendiculatus, Latr.—Tetuan, 20th June; 1 ♂.

[*Macronemurus*, *sp. n.*—Tangier, *Blackmore*; 1 ♂. Allied to *appendiculatus*, but certainly distinct on account of the neururation being entirely pale, and the abdomen *much shorter* when compared with males of *appendiculatus* of the same expanse. I hesitate to describe it without having more materials.]

Myrmeleon distinguendus, Ramb. ?.—Esmir, 25th July; 1 example. I consider the determination very probably correct, but the only other example before me is one from Portugal (presumably; *cf.* Journ. Linn. Soc., Zoology, xvi, p. 172), which is scarcely typical.

N.B.—It is most unfortunate that the obscure Mediterranean Ant-Lions usually arrive as only isolated individuals, and often in indifferent condition.

Ascalaphus ictericus, Charp.—Tangier, 14th June; 2 ♀.

[*Chrysopa vulgaris*, Schneid.—Tangier, *Blackmore*.]

ODONATA.

Lepthemis trinacria, Selys.—Esmir, 25th September; 1 very adult ♀, almost entirely “saupoudrée” as in the adult ♂.

Orthetrum cærulescens, F.—Esmir, 16th July; 1 adult ♀.

Orthetrum Ramburii, Selys.—Esmir, 25th July; 1 adult ♂.

Diplacina flavistyla, Ramb.—Esmir, 16th July; 1 ♀. A new district for this wide-spread species. I submitted the example to my friend Baron De Selys-Longchamps.

N.B.—In the “Revue des Odonates,” p. 312 (1850), De Selys gave *parvula* and *Lefebvrei*, Ramb., as synonyms. To this he would now add *tetra*, Ramb., originally from Mauritius, and since found in Madagascar, and, I think, Zanzibar; it sometimes, not always, has a faint dusky band under the pterostigma, which induced Rambur to place it in a separate section: he also adds *concinna*, Ramb., probably founded on an immature ♀. I am quite disposed to agree with him, and think the different forms are partly due to differences in locality, and especially to differences in degree of maturity. In this case *flavistyla* is widely distributed:—Mauritius, Madagascar, Delagoa Bay, Zanzibar, Gaboon, Senegal, Marocco, Algeria, Egypt, Arabia, &c., and perhaps Palestine. Judging from my own materials, I should doubt the advisability of retaining the synonyms as varietal names. It is perhaps not a true *Diplacina*, taking *D. nana*, Brauer, as the type.

Onychogomphus uncatus, Charp.—Benzus Bay; 1 ♂.

Cordulegaster annulatus, Latr. (var. *immaculifrons*, Selys).—Benzus Bay, 24th June; 1 ♂.

Anax formosus, V. d. Lind.—Esmir, 16th July; 1 ♂, 2 ♀.

Hemianax ephippiger, Burm.—Esmir, 16th July; 2 ♂.

Calopteryx hæmorrhoidalis, V. d. Lind.—Benzus Bay, 25th August; 1 ♂.

Lestes virens, Charp.—Esmir, 16th July; 1 ♂, which has the back of the head discoloured (?), and hence the appearance is deceptive.

Lestes barbara, F.—Esmir, 16th July; 1 ♂.

[*Sympyca fusca*, V. d. L.—Tangier, *Blackmore*; one example is labelled “December;” the insect hibernates.]

Ischnura Graellsii, Ramb.—Esmir, 16th July; 2 ♂, 1 ♀ [also from Tangier, *Blackmore*, several examples.]

N.B.—Kolbe's *I. maroccana*, from Casablanca, must be very closely allied, if distinct. His description is chiefly comparative with *senegalensis*, the only allusion to *Graellsii* being that the superior appendages of *maroccana* are "spitzer" than in the former: I find no difference in this respect between examples of *Graellsii* from Morocco and Portugal. He calls attention to a peculiar character on the dorsum of the *second* abdominal segment of the ♂, which I give in his own words—"auf dem Rücken vor dem Hinterrande eigenthümlich zweimal quer eingedrückt und mit einem Höcker zwischen dem beiden Eindrücken." This agrees precisely with all my ♂ of *Graellsii*, and is a valuable character entirely overlooked by previous authors, at once isolating the species from the otherwise allied *senegalensis*, *Genei*, and *elegans*. In recording my doubts as to the distinctness of *maroccana*, it is but just to say that I have not seen the types.

[*Agrion puella*, L.—Tangier, *Blackmore*.]

[*Agrion Lindenii*, Selys.—Tangier, *Blackmore*.]

Pyrrhosoma tenellum, Villers.—Esmir, 25th July; 1 ♂.

Lewisham, London:

June, 1889.

OBSERVATIONS ON COCCIDÆ (No. 5).

BY ALBERT C. F. MORGAN, F.L.S.

I am indebted to Mr. Douglas for a great many specimens of *Coccidæ* which he has sent to me from time to time, either for determination of the species or for my information, and it will perhaps now be convenient to give a list of the plants and of the species found upon each.

Pieces of bark of apple, plum, and cherry—*Mytilaspis pomorum* and *Aspidiotus ostreæformis*.

✓ *Anthurium Harrisii* (from Royal Gardens, Kew), and *Cælogyne cristata* (Mr. O'Brien and on orchid from Kew)—*Aspidiotus ficus*.

Orchid (name not furnished) from Mr. P. Cameron—*Diaspis Boisduvalii*.

✓ Mango leaf from Demerara, sent by Mr. S. J. McIntire—*Diaspis rosæ*, *Ischnaspis filiformis*, and *Aspidiotus personatus*.

✓ *Areca lutescens* (Royal Botanic Soc. Gardens)—*Mytilaspis buxi*, Sign., = ? *Mytilaspis pandani*, Comst.

Anthurium acaule (Royal Botanic Soc. Gardens)—*Fiorinia pellucida*, Targ.-Tozz., = ? *Uhleria camelliæ*, Comst.

✓ Orange (from Demerara), Mr. McIntire—*Chionaspis citri*.

✓ *Anona cherimolia* (Kew), and *A. muricata* (Royal Botanic Soc. Gardens)—*Chionaspis biclavus*.

Cocoa palm leaves (from Barbados), Mr. D. Morris—*Fiorinia pellucida* and *Mytilaspis buxi*.

✓ *Dictyospermum album* (from Trinidad), Mr. McIntire—*Ischnaspis filiformis*, *Mytilaspis buxi*, *Aspidiotus articulatus*, *n. sp.*, and *Aspidiotus dictyospermi*, *n. sp.*
 ✓ *Cupania sapida* (from Demerara), Mr. McIntire—*Aspidiotus longispina*, *n. sp.*, and *Planchonia fimbriata*.

Besides the above, other species have come under my notice from other sources, and I will now enumerate those belonging to the genus *Aspidiotus*.

1. ASPIDIOTUS NERII, Bouché.

All the synonyms of this species will be found in Sign. Ess. s. l. Coch., p. 60, and a description (*op. cit.* p. 100, pl. i, iii and iv). Rep. U. S. Dept. Ag., 1880, Comstock, p. 301, pl. iv, fig. 1, pl. xv, fig. 1. 2nd Rep. Corn. Univ. Exp. St., 1883, Comstock, p. 63, fig. 4. Beit. z. Anat. und Hist. d. Pflanzenläuse, Mark, 1876, figs. 1, 4, 5, 6, 11, 12, 31, 33, 35. Ent. Mo. Mag., vol. xxiii, p. 151, Douglas.

2. ASPIDIOTUS OSTREÆFORMIS, Curtis.

Douglas, Ent. Mo. Mag., vol. xxiii, p. 239.

Mr. Douglas has already described this species, and has shown that it should not be confused with the *Diaspis ostreæformis*, Signoret, in which opinion Prof. Comstock concurred, and my own observations confirm those of Mr. Douglas. The difference in the shape of the scales of the male at once distinguishes the two insects, but besides this, the caudal margin of the two species shows a marked difference. In *Aspidiotus ostreæformis* the inner lateral margins of the median pair of dorsal lobes extend upwards encircling the anus, whereas in *Diaspis ostreæformis* the median pair of lobes appear to have no immediate relation to the anus. I look upon this as an important structural difference, for I have observed that the correlation of the anus with the median lobes forms an important specific character.

Abundant on pieces of bark of apple, plum and cherry, received from Mr. Douglas. On the same bark were found in plenty *Mytilaspis pomorum*. I have found *Aspidiotus ostreæformis* also on *Calluna vulgaris* in Portugal, associated on the same plant with *Mytilaspis pomorum*. This fact deserves perhaps to be noted, and I may mention that the ♂ scale of *A. ostreæformis*, when fully developed, is sometimes of such an elongated oval shape, that it much resembles a young *Mytilaspis*, except that the larval skin of *Aspidiotus ostreæformis* always lies within the limits of the scale.

3. ASPIDIOTUS PERSEÆ.

Aspidiotus perseæ, Comstock, Rep. U. S. Ag. Dept., 1880, p. 305, pl. xii, fig. 3, pl. xiii, fig. 3; 2nd Rep. Corn. Univ. Exp. St., 1883, p. 65.

This is one of Comstock's species, and there is no difficulty in recognising it from his full description and figures. I have found it on *Anthurium Harrisii* from Kew, sent to me by Mr. Douglas, and Prof. Comstock took it from the red bay (*Persea carolinensis*).

4. ASPIDIOTUS FICUS (Riley MSS.), Comst.

A full description, life history and figures of this species by Comstock will be found, *op. cit.*, p. 296.

It appears to be common in Florida (U. S. A.), and in Cuba. My specimens were taken from *Spondius lutea*, and *Cœlogyne cristata*, from Mr. O'Brien and Kew, received from Mr. Douglas.

5. ASPIDIOTUS PERSONATUS.

Aspidiotus personatus, Comstock, 2nd Rep. Corn. Univ. Exp. St., 1883, p. 66, pl. iii, figs. 2 and 2a.

This remarkable species was first discovered by Professor Comstock on leaves which he received from Havannah, where he mentions it infests the leaves of various shrubs in the public gardens. I found it on pieces of leaf of mango from Demerara, sent by Mr. McIntire.

6. ASPIDIOTUS CAMELLIÆ.

Aspidiotus camelliæ, Sign., Ess. s. l. Coch., p. 91, pl. iii, fig. 9; Maskell, New Zeal. Sc. Ins., p. 41, pl. iv, fig. 2; *nec Kermes camelliæ*, Boisd., Ent. Hort. (1867), p. 334.

Aspidiotus rapax, Comstock, Rep. U. S. Dept. Ag., 1880, p. 307, pl. xii, fig. 6; 2nd Rep. Corn. Un. Exp. St., 1883, p. 67.

I have already pointed out (Ent. Mo. Mag., vol. xxiv, pp. 68, 79), the apparent differences between *A. rapax*, Comstock, and *A. camelliæ*, Sign., but I am now inclined to believe that the two species are identical, and the points of difference are due to Prof. Comstock's more elaborate and exact description. I have found the species very common in Portugal, living in abundance in the open air on *Camellia* and other plants, and I can hardly think that it would not have come under Dr. Signoret's notice. It is also mentioned by Maskell as common in New Zealand. But it seems to me that *Aspidiotus camelliæ* cannot be identical with *Kermes camelliæ*, Boisdual, because, although no doubt it would be difficult from Boisdual's description to know what his species is, yet it is less difficult perhaps to realize what it is not. Boisdual mentions (*l. c.*) that it is "allongé, ovale, linéaire, un peu déprimé, d'un brun roux, souvent légèrement arqué, rappelant un peu par sa forme le Kermes coquille." * * * This description does not seem to me to apply at all to an *Aspidiotus*, and the "Kermes coquille" was considered by Boisdual identical (*op. cit.* p. 315) with *Chermes conchiformis*, Gmelin, so that if his *Kermes camelliæ* is similar in shape, as he suggests, to the "Kermes coquille," I should think it more likely to be a *Mytilaspis*, and possibly, as Targioni-Tozzetti suggests in his Catalogue, 1868, p. 44, *M. linearis*.

7. ASPIDIOTUS ZONATUS, Frauenfeld.

I have already described this species (Ent. Mo. Mag., vol. xxiv, p. 205), and Mr. Douglas has also done so (Ent. Mo. Mag., vol. xxiii, p. 150).

Found in Austria on *Quercus montana*, in England and Portugal on *Quercus robur*, and in France also on the common oak. It does not appear to have been found yet out of Europe.

8. *ASPIDIOTUS ARTICULATUS*, *n. sp.* (pl. v, figs. 3 and 5).

♀ scale greyish-white, depressed, more or less circular. Exuviae in the centre.

♀ insect pyriform, with a marked division between the thoracic and abdominal regions. The median pair of lobes on the caudal segment is notched on the outer lateral margin, the 2nd pair is similar in shape, but larger than the median pair. There is no third pair as usual, but on the dorsal side anterior to the third plate is a pointed process, similar to that mentioned by Prof. Comstock as existing in *Diaspis Boisduvalii*. There is one branched plate between the median lobes, two similar plates between the first and second lobes, and three between the second lobe and the pointed process above mentioned. Of these three plates the third is the largest and sabre-shaped. Anterior to the pointed projection is a long, compressed, serrated plate, followed by two or three shorter and simple plates. The spines are very small; one is situated at the base of each lobe, one at the base of the pointed process, and one on the lateral margin beyond. There appear to be only two groups of ventral glands, each group consisting of three or four glands.

The species may at once be recognised by the separation of the thorax from the abdomen.

Found on *Dictyospermum album* received by Mr. McIntire from Demerara.

9. *ASPIDIOTUS LONGISPINA*, *n. sp.* (pl. v, fig. 1).

♀ scale dark colour, with exuviae in the centre, and a small concentric circle in the centre of the first larval skin. The exuviae and the concentric circle are difficult to observe, as the whole scale and exuviae appear of a very dark colour. The scale is inconspicuous, and measures only about '6 mm., convex.

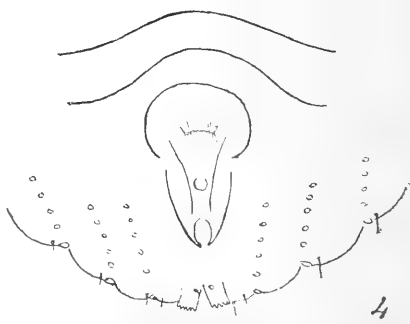
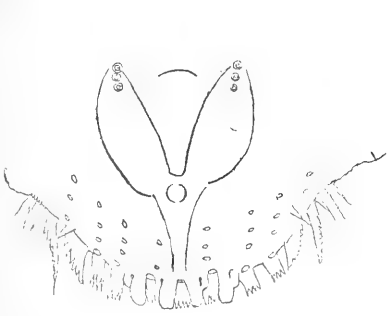
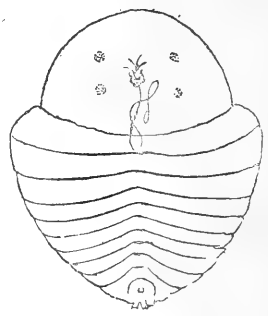
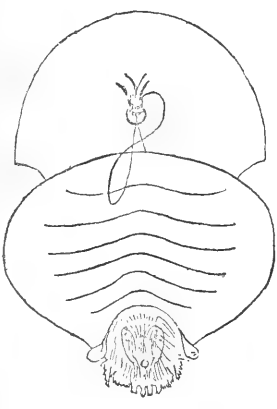
♀ insect pyriform. The caudal margin has only one pair of lobes, which are long, with the outer lateral margin doubly notched. The anus is situated between the bases of these lobes. There are about eight simple plates along the margin, which are remarkable for their length. Four spines, which are even longer than the plates. The first spine is adjacent to the base of the lobe, and the distance between the second and third and third and fourth is about equal, and twice the distance of that which separates the first from the second spine. The length of the spines and plates is characteristic of this species.

Found on *Cupania sapida* from Demerara, which was sent to Mr. Douglas by Mr. McIntire.

10. *ASPIDIOTUS DICTYOSPERMI*, *n. sp.* (pl. v, fig. 2).

♀ scale greyish-white, with exuviae in the centre, depressed, of an elongate oval shape, about 1.2 mm. longest diameter. The centre of the larval skin is of a dark orange colour, whilst the exuviae are of a light yellow.

♀ insect has three pairs of lobes. The median pair is the largest, notched on the outer lateral margin, the second lobe is similar to the first in shape, but smaller, and the third lobe is still smaller, with the outer lateral margin serrated. Two simple plates between the median lobes, two between the first and second lobes, and three between the second and third. The third lobe is followed by two long plates, serrated on the outer lateral margin. Anterior to the last plate the margin is serrate up to the commencement of the next visible segment. The lateral margins of the first and second lobes are thickened at the base. Four small spines situated as



A.C. 39m
191

usual. Four groups of ventral glands, the anterior group consisting of three or four, and the posterior of two glands. The anus is situated just above the base of the median lobes. There is a considerable similarity between this species and *A. ficus*, but the plates are different, and the scale is completely different, the one oval, greyish-white and flat, the other almost black, convex and circular.

Found on *Dictyospermum album* from Demerara (McIntire).

11. ASPIDIOTUS ACACIÆ, n. sp. (pl. v, figs. 4 and 6).

♀ scale circular, convex, exuviae in the centre, of a rather waxy nature, about 1 mm. diameter. Scale colour of the bark, with larval skin orange-yellow.

♀ insect segmented, with thoracic region contracted, whilst the base of the abdomen is dilated. There are no groups of abdominal ventral glands, but on each side of the mouth is a group of about fifteen, and posterior to this on each side is a group of about ten glands. Each of these groups is placed just anterior to a spiracle. One pair of well developed lobes, the serrated posterior margins of which slope upwards outwardly, rectangular. The margin is crenate, with a glandular opening at each point of indentation; three in all. A small spine is placed on the margin of each rounded tooth. The indentations suggest boundaries of rudimentary segments. One small simple marginal plate adjacent to the outer lateral margin of the median lobes. Rows of simple spinning glandular openings extending anteriorly. On the ventral side there appears to be a ventral plate terminating in a crescent-shape form, as shown in the figure.

Found on *Acacia pycnantha* (golden wattle) from Tasmania; received from my friend Mr. William Tait, of Oporto.

This species shows, as will be seen, some unusual characters, but, judging from the position of the exuviae, I think it may be placed in the genus *Aspidiotus*.

EXPLANATION OF PLATE V.

Fig. 1—*A. longispina*, caudal segments much magnified.

„ 2—*A. dictyospermi*, do. do.

„ 3—*A. articulatus*, do. do.

„ 4—*A. acaciæ*, do. do.

„ 5—*A. articulatus*, magnified 50 times.

„ 6—*A. acaciæ*, do.

P.S.—Any slight discrepancies between the description and corresponding figure arise from the distance which separates the author from the engraver.

Villa Nova de Gaya, Portugal:

May 11th, 1889.

Microdus calculator, Fab.—Mr. C. W. Dale, a few months ago, sent me a box of Ichneumons to name, principally very old insects, but among them is a fine fresh female of *Microdus calculator*, F., taken by himself in the New Forest; this is very interesting, as the Rev. T. A. Marshall, in his monograph of the *Braconidæ*, says that it seems to have been found in England only by Curtis, and that no recent specimens are forthcoming. Curtis took both male and female in the same locality, viz., the New Forest. This specimen has the hind femora entirely black.—JOHN B. BRIDGMAN, Norwich: July 13th, 1889.

SYNOPSIS OF THE BRITISH *ORTHOPTERA*.

BY ELAND SHAW, F.E.S.

Though I have delayed for a long time the publication of this paper, in order that I might increase my own knowledge of the British *Orthoptera* and their distribution, I now find that this knowledge is but very imperfect and scanty, and must claim the indulgence of entomologists for the many errors which will no doubt be found.

Several entomological friends have for some time past urged me to publish some such paper, as they assured me that some ready means of identifying the species would induce many collectors to interest themselves in this much neglected Order. With this object, full analytical tables of the genera and species have been given, and though the characters used may not in all cases be sufficient to distinguish British from allied European genera and species, their simplification will, I hope, make the tables more useful to students of the British forms. The last systematic work in English of any importance is in Stephens' *Illustr. Brit. Ent., Mandib.*, vi, pp. 3—48; this was published more than fifty years ago (1835), and in many cases the correct descriptions copied from the works of Charpentier or other continental authors seem to have been applied to British specimens of other genera and species.

Fischer's "*Orthoptera Europæa*," Leipzig, 1853, will be found a most useful and reliable work, and amongst its plates are illustrations of all the British species; but the book which will be of the greatest value to modern Orthopterists is Brunner von Wattenwyl's "*Prodromus der europäischen Orthopteren*," Leipzig, 1882. I have taken this as my guide, and have largely borrowed from it in drawing up the analytical tables. It is written in German, with the tabular and descriptive parts in Latin; but those who prefer French will find useful Finot's "*Les Orthoptères de la France*," Paris, 1883, which is compiled from Brunner's *Prodromus*.

Under the different Families will be found such details of structure as are necessary. The nomenclature and classification is, with certain modifications, that of the modern continental authors.

It gives me great pleasure to acknowledge the kindness of those who have given me specimens from many different localities, particularly that of Messrs. McLachlan, Porritt, Saunders, and Winston.

TABLE OF FAMILIES.

- 1 (4) Hind femora formed for running; elytra and wings in the larva normally placed; insects not stridulating.
- 2 (3) Wings when present folded at the middle of the anterior margin; tarsi 3-jointed; cerci horny, forming a forceps I. FORFICULIDÆ.
- 3 (2) Wings when present folded from the base; tarsi 5-jointed; cerci, soft, jointed II. BLATTIDÆ.
- 4 (1) Hind femora formed for jumping; elytra and wings in the larva inverted; insects stridulating.
- 5 (6) Antennæ short; stridulating organs situated in the posterior femora and anterior portion of the elytra; ovipositor short III. ACRIDIIDÆ.
- 6 (5) Antennæ long; stridulating organs situated in the anal area of the elytra; ovipositor long, ensiform.
- 7 (8) Tarsi 4-jointed IV. LOCUSTIDÆ.
- 8 (7) Tarsi 2- or 3-jointed V. GRYLLIDÆ.

I.—FORFICULIDÆ.

The earwigs, together with the *Blattidæ*, *Mantidæ*, and *Phasmidæ*, are distinguished easily from the other three families by the absence of jumping legs, their hind femora being formed for running, while they are separated from the *Blattidæ*, the other British family, by their cerci being developed into forceps, by their peculiarly folded wings, and their three-jointed tarsi. The question as to their value as a Family or Sub-Order need not be discussed here; but they are now generally regarded as part of the *Orthoptera*.

TABLE OF GENERA.

- 1 (4) Antennæ with 16—30 joints.
- 2 (3) Elytra and wings fully developed i. *Labidura*.
- 3 (2) Elytra and wings absent ii. *Anisolabis*.
- 4 (1) Antennæ with 10—15 joints.
- 5 (6) Second joint of the tarsi cylindrical; subgenital lamina ♂ toothed iii. *Labia*.
- 6 (5) Second joint of the tarsi cordiform; subgenital lamina ♂ plain.
- 7 (8) Legs of the forceps ♂ dilated at the base and contiguous there. Wings perfectly developed iv. *Forficula*.
- 8 (7) Legs of the forceps ♂ not dilated at the base and remote there. Species wingless v. *Chelidura*.

i.—LABIDURA, Leach.

This genus has only a single representative here, and only two other species are known in Europe, one from Spain, and the other a doubtful one reported from the crater of Vesuvius.

1.—*LABIDURA RIPARIA*, Pall.

Forficula riparia, Pallas, Reisen, ii, Anhang, p. 30; Brunner von Wattenwyl, Prod. der Eur. Orth., p. 5, fig. 1.

Forf. gigantea, Fabr., Ent. Syst., ii, p. 1; L. Fischer, Orth. Eur., p. 65, tab. vi, fig. 1, 1a—f.

Labidura gigantea, Steph., Mandib., vi, p. 8.

Reddish-testaceous. Antennæ yellow. Pronotum with the margins paler, and with the posterior margin somewhat rounded. Elytra with the internal margins rufous. Legs pale. Abdomen above and below with the disc rufous and the margins paler, with all the segments somewhat rugose. Anal segment in both sexes with a tubercle on each side over the inner side of the insertion of the legs of the forceps, and in ♂ with two teeth in the posterior margin. Legs of the forceps in both sexes slightly incurved and fuscous towards the apex, with minute denticulations along the inner margin. The ♂ has a large tooth on the inner side of the forceps beyond the middle of their length. Length, 19—30 mm.

There are some half-dozen records of the capture of this fine species, ranging from Rev. W. Bingley's original captures in 1808 to that of the one in the possession of the late Mr. Kemp Welch, which was taken on the Dorset coast in 1886. The head quarters of the species seems to be at Christchurch, Hants, where, in Bingley's time, it appears to have been plentiful, and possibly it only wants looking for to turn up in some numbers. It should be looked for about high water mark in the evening. The other localities are Bournemouth, Hengistbury Head, Folkestone.

ii.—*ANISOLABIS*, Fieb.

This genus differs from *Labidura* in having no elytra or wings (as far as European species are concerned). in the lesser number (16—24) of joints in the antennæ, and in its unsymmetrically curved forceps.

1.—*ANISOLABIS MARITIMA*, Bonelli.

Forficula maritima, Bonelli, Génér. Monogr. Forf., p. 9; Fischer, Orth. Eur., p. 68, tab. vi, fig. 4, 4a—d.

Anisolabis maritima, Fieb., Syn., p. 74; Brunner, Prod. der Eur. Orth., p. 9, fig. 2.

Above dark pitchy, shining, below fulvous. Antennæ 24 joints, fuscous. Pronotum nearly oblong, with a median longitudinal suture. No elytra and wings. Third abdominal segment with a slight fold on the dorsal aspect. Last ventral segments punctate. Legs of the forceps remote at the base in the ♂, internal margin denticulate, apices curved unsymmetrically, the right more than the left. In ♀ symmetrical incurved and decussating at the apex. Length, 20—25 mm.

This species has hitherto only occurred at South Shields, where it was captured in some numbers by Mr. T. J. Bold in 1856, and he

published some notes on it in the Trans. Tyneside Nat. Field Club, iv, 1858—60, pp. 55, 56. He was of opinion that the species was introduced by shipping, and established itself, as he found a young one in September, 1856. I have not been able to find out whether it is still to be found in this locality. Mr. Bold distributed specimens amongst several collections, and there are eight in the Brit. Mus. Coll. given by him. It will be interesting to know whether we may consider this as a really British species now, or only as a casual visitor.

iii.—LABIA, Leach.

The small number of joints in the antennæ, and the simple cylindrical middle joint of the tarsi, distinguish this genus. It has only one representative in Europe, and this also occurs in Asia Minor and N. America.

1.—LABIA MINOR, Linné.

Forficula minor, Linné, Syst. Nat., ii, p. 686; Fischer, Orth. Eur., p. 70, tab. vi, fig. 7a—d.

Labia minor, Leach, Edinb. Encycl., ix, p. 118; Steph., Mandib., vi, p. 8; Brunner, Prod. der Eur. Orth., p. 10, fig. 3.

Of small size, generally testaceous. Head fuscous. Antennæ fuscous. Articulations 10—12 with the first two and last two or three paler. Pronotum with the posterior margin rounded. Wings with that portion projecting beyond the elytra long. Legs straw colour. Legs of the forceps ♂ remote at the base, incurved at the apex, with a few teeth on the inner margin. In ♀ contiguous at the base.

Length, 6—8 mm.

Its considerably smaller size readily separates this species from the other earwigs. It may be found plentifully flying in the day time about gardens and dunghills in June. It is widely distributed all over Europe.

iv.—FORFICULA, Linné.

TABLE OF SPECIES.

- 1 (2) Legs of the forceps ♂ contiguous at the extreme base; separated at the lowest tooth. Wings perfectly developed 1. *auricularia*, Linné.
- 2 (1) Legs of the forceps ♂ contiguous for the whole length of the base. Wings abortive 2. *pubescens*, Géné.

1.—FORFICULA AURICULARIA, Linné.

Forf. auricularia, Linné, Syst. Nat., ii, p. 686; Steph., Mandib., vi, p. 4, pl. xxviii, fig. 1; Fischer, Orth. Eur., p. 74, tab. vi, figs. 11, 11a—t.

Forf. media (Marshall), Steph., Mandib., vi, p. 5, pl. xxviii, fig. 2; *Forf. borealis* (Leach), *ibid.*, fig. 3; *Forf. forcipata*, *ibid.*, p. 6, fig. 4.

Generally fuscous or ferruginous. Head ferruginous. Eyes black. Antennæ

with 15 articulations, with the first and sometimes the second paler than the rest. Pronotum fuscous, with paler lateral margins. Elytra testaceous. Wings hyaline, more than twice the length of the elytra. Legs testaceous. Anal segment ♂ with four tubercles posteriorly; the two interior rounded and the exterior fold-like. Legs of the forceps testaceous or fuscous, often darker at the apex and along the interior margin; varying greatly in length and degree of curvature; dilated at the base with small uneven teeth on the inner margin, and one large one after they have commenced to diverge. Anal segment ♀ with the tubercles less strongly marked, gradually tapering to the apex, where they decussate.

Length, body, 10—15 mm.; forceps, 3—9 mm.

The common earwig is ubiquitous. The forms named *media*, *borealis*, and *forcipata*, described as different species on account of their more elongated forceps, are considered by the continental authors as identical with *auricularia*, L., and I think rightly so; though the working out of their life histories may prove them distinct varieties. Here, as with most of our common *Orthoptera*, much work remains to be done.

(*Forf. neglecta*, Marsham. Ent. Brit., p. 529, = *F. auricularia*, L. This is the ordinary ♀ which Marsham described as a distinct species. Leach notices this, Edinb. Encycl., ix, p. 118.

Forf. media, Marsham. Ent. Brit., p. 530, = *F. auricularia*, L. Described and figured (forceps) by Stephens. The forceps are slightly elongated. Not uncommon.

Forf. borealis, Leach MS. Steph. Mandib., vi, p. 5, pl. xxviii, fig. 3, = *F. auricularia*, L. Forceps rather more elongated. Not uncommon.

Forf. forcipata. Steph., Mandib., vi, p. 6, pl. xxviii, fig. 4, = *F. auricularia*, L. Forceps considerably elongated, sometimes two-thirds the length of the body. Not uncommon.)

2.—FORF. PUBESCENS, Géné.

Géné, Serville Orth., p. 46; Fischer, Orth. Eur., p. 77, tab. vi, figs. 15a—f.

Not so large as *auricularia*, L., generally testaceous, somewhat pilose. Head reddish. Antennæ rather paler, 13-jointed. Pronotum almost square. Elytra testaceous, entirely concealing the wings, which are minute and rudimentary. Legs pale. Abdomen rather darker, faintly punctate. Anal segments with two tubercles above the insertion of the forceps. Legs of the forceps in ♂ with the basal part dilated and long; with slight denticulations on the internal margin, almost contiguous for their whole length. Apical part strongly curved. Legs of the forceps in ♀ nearly straight, slightly incurved at the apex, not decussating.

Length, 9—11 mm.

I am not aware that this species has been hitherto described as British. Mr. C. W. Dale sent me two specimens captured amongst reeds on the Dorsetshire coast. I believe he regarded them as *Chelidura albipennis*, Meg., but in his article, "Our British *Orthoptera*,"

"Young Naturalist," 1886, part 84, p. 237, queries *F. pubescens*, Gén  , and *F. decipiens*, Gén  , as synonymous with *C. albipennis*, Meg. As to its European distribution *F. pubescens* is reported from several localities along the Mediterranean coast, and Bolivar states that it occurs in Galicia in N.-W. Spain, so that we might not unnaturally expect to find it on our south coast.

v.—CHELIDURA, Latreille.

(*Apterygida*, Westw.).

This genus, in common with *Forficula*, is separated from *Labia* by its cordiform second tarsal joint, while the form of its forceps easily distinguishes it from *Forficula*, and the species is wingless.

1.—CHELIDURA ALBIPENNIS, Megerle.

Forficula albipennis, Meg., Charp., Hor   Ent., p. 68.

Forf. (Apterygida) albipennis, Fisch., Orth. Eur., p. 77, tab. vi, figs. 14, 14a, b.

? *Chelidura albipennis*, Steph., Mandib., vi, p. 7, fig. 5.

? *Forf. centralis*, Westw., MS.

Pale testaceous. Antenn   12-jointed. Pronotum testaceous. Elytra perfectly developed. Wings absent. Legs testaceous, sometimes darker. Abdomen punctate, hairy. Legs of the forceps    remote at the base, and not dilated, hairy, with a tooth near the base and another beyond the middle. Legs of the forceps    shorter, nearly straight, slightly incurved at the apex.

Length, body, 6—10 mm. ; forceps, 2—5 mm.

Stephens describes this species as British, and his description and figure of the male forceps no doubt refer to *Ch. albipennis* ; but I have not yet succeeded in obtaining specimens. The original specimens captured at Ashford by Prof. Westwood are, I believe, still in Oxford. *Albipennis* is found all over middle and southern Europe, and also in Belgium.

(To be continued.)

Heptaulacus villosus, Gyll., in profusion at Cobham Park, Kent.—Yesterday morning (June 20th), as briefly noticed in the July No., Dr. Sharp and I met at Strood for a day's collecting at Cobham Park. We had worked for several hours without meeting with anything noteworthy (except, perhaps, a single specimen of *Homalopia ruricola*, which was new to the district), when, at 3.30 p.m., we came to a sunny glade in the Park, well known to one of us as a favourite resort of many good insects. Here I spied a little brown beetle on a grass-stem, which a second glance assured me was nothing less than *Heptaulacus villosus* ; and while stooping down to secure my prize, I saw two or three more, within arm's length ! Calling to Dr. Sharp (who could scarcely at first realize my good fortune), we set to work vigorously ; and on a sunny bank, covered with high grass, and well sheltered from the somewhat cool east wind which was blowing, we obtained the beetle in very

large numbers. Its "head-quarters" was a space not twice as big as an ordinary room, scarcely a straggler being seen at a distance of twenty yards. Most of the examples were got by sweeping the grass, but it could easily be seen and picked off the stems, and I caught several on the wing. The *Heptaulacus* had the place all to itself, the only other beetles to be seen in the sweeping-net being *Isomira murina* and an occasional *Dascillus cervinus*.

We are at a loss to account for this extraordinary assemblage of so rare a beetle: though Dr. Sharp's suggestion that it is attached to rabbit's dung (the runs of these animals being numerous in the locality), seems at least feasible.

Abdera 4-fasciata again turned up, not rarely, among small *Boleti* on the old hornbeam tree, where I took it in 1886, and the same tree now supports a thriving colony of *Melasis buprestoides*.—JAMES J. WALKER, 23, Ranelagh Road, Sheerness: June 21st, 1889.

Abræus granulum, Er., at Cobham.—A few minutes before we fell in with the *Heptaulacus villosus*, I found several *Abræi* at the foot of an old ash tree, under a hard woody fungus, on the spores of which they were apparently feeding. These I handed to Dr. Sharp as *A. globosus*, a fairly common insect in the Park; but on visiting him two or three days afterwards, he showed me one of them, noticed by us at the time of capture as being very small, which he had determined to be the very rare *A. granulum*, Er. I went to look for it again on June 29th, and found three specimens in the very same spot as before, in company with *A. globosus*.

The day being very hot, and favourable for collecting, some good beetles appeared in the sweeping-net, among them being *Homalota hepatica* (two in one sweep), *Thalyera sericea* (1), *Saprinus virescens* (1), and *Conopalpus testaceus* (2), all, except the first-named, being new to the locality. *Pocadius ferrugineus*, also an addition to the Chatham list, was found in toadstools, in company with *Oxyporus rufus*.—ID.: July 1st, 1889.

A new locality for Potaminus substriatus.—At Easter, I was staying for a day or two at Bodle Street, a small village near Ashburnham, Sussex, and while there took a few specimens of this rare beetle. I have not had a chance of re-visiting the locality until last Monday, when I went prepared for a day's *Potaminus* hunting. I reached the ground about 11 o'clock, and worked steadily on till nearly six. By that time I had thoroughly hunted about a mile and a half of the stream, and had secured some eighty specimens. I see that Rev. Canon Fowler says, it is found under clods and stones, "but not apparently under submerged logs;" when I could find the logs, they proved quite as productive as the clods. On one small piece I took ten specimens of *Potaminus*, and saw quite a score of *Orectochilus villosus* skipping about.

I also took four specimens of *Deronectes latus*, a species which I have also taken in numbers in a rapid stream at Guestling during the last month.—W. H. BENNETT, 11, George Street, Hastings: July, 1889.

The black variety of Limenitis Sibylla.—On the 6th inst., at Lyndhurst, I had the good fortune to capture a fine specimen of the black variety of *Limenitis Sibylla*.—ALLAN MARRIOTT, 6, Dalmony Road, Tufnell Park, N.: July 18th, 1889.

Further hints as to the food of Gelechia (Cladodes) gerronella, Z.—Monsieur Jourdheuille has had the pleasure of breeding this insect. In the spring of 1887, wishing to obtain some tenanted cases of *Coleophora albicosta* after hibernation, he collected a quantity of the seeds of *Ulex europæus*, and of the dry tips of the twigs of that plant. Much to his surprise, on the 5th of the following July, four specimens of *G. gerronella* made their appearance (Annales Soc. Ent. France, 1888, p. 66). M. Jourdheuille adds: "Unfortunately, I have not been able to observe the larva, which was, no doubt, already in the pupa state when I was gathering the plant; but entomologists will now know, with some precision, in what direction further research should be made."—H. T. STAINTON, Mountsfield, Lewisham: June 25th, 1889.

Gelechia (Doryphora) servella, Zeller, bred in a London suburban greenhouse.—A specimen of this species was sent to me by Mr. James Malings for determination; it had been caught in a greenhouse, April 21st, 1889, at Shrewsbury Lane, Shooter's Hill, and the captor could only suggest that the pupa had been introduced in some potting compost bought at the C. S. S. A. Stores. This insect (unicolorous grey, with three black spots) was not previously known as a British species, though it has a wide range in Europe, as I have specimens from Finland and Livonia (received through Zeller), from Switzerland (received through Staudinger), and from the South of France (received from Lord Walsingham). Some of the specimens have a much darker ground-colour than others, but the markings seem very constant—an elongate or dash-like spot on the fold, and, beyond it, two round black spots on the disc. As nothing is yet known as to the food of the larva of the species, it is difficult to account for its appearance in the greenhouse above-mentioned.—ID.: July 13th, 1889.

Chauliodes insecurellus in Wilts.—Early in June, a specimen of this species flew in at my window in Marlborough, which faces an open down. On the 15th, during an excursion to Stonehenge, we captured several specimens on the downs round the temple, mostly flying towards sunset. This insect is, perhaps, overlooked; Stainton gives the end of July and August as its season of flight, but this must refer to a second generation; Heinemann gives May and June for Germany. One, at least, of those captured was too fresh to have hibernated.—E. MEYRICK, Ramsbury, Hungerford: June 25th, 1889.

[Mr. Warren, in his paper on the *Chauliodidæ*, Ent. Mo. Mag., xxiv, pp. 141—147, gives, at p. 144, the times of appearance of *Ch. insecurellus*, thus:—

Imago, end of May and beginning of June, and again end of July and August.
Larva feeds up in April and May, and again in July.—H. T. STAINTON.]

Deilephila insidiosa, Erschoff.—On recently turning over Erschoff's *Lepidoptera* of Turkestan (published as part of Fedchenko's Reise), I found a note in Russian, at the foot of p. 24, of which the following is the substance:—"Eversmann's collection contains a specimen labelled *D. hippophaes*, Esp., from the Syr Daria. *D. hippophaes* is not found in the Russian Empire, and the example in question, though closely allied, differs in several points. The colour of the thorax and of the forewings above is much paler, more like that of *D. zygophylli*, Ochs. A tuft from the

shoulder-stripe projects a little on the outside about the middle of the wing, as in *D. hippophaes*. Except the dark part near the costa, it is scarcely marked. Should this be a new species, as is very probable, Erschoff proposes for it the name *D. insidiosa*."

I have seen no later notice of this insect; but the indications, though brief, appear to be sufficient to identify it, if it should be re-discovered; and now that the insects of Central Asia are so much studied, I thought that I might, perhaps, prevent its being re-described as new, by calling special attention to it, especially as it was not included in the Zoological Record for 1874.—W. F. KIRBY, Zoological Department, British Museum (Natural History), South Kensington: *June 21st*, 1889.

Fumea (?) *limulus*, *Rogenhofer*.—Under this name, Herr Rogenhofer describes and figures a very singular case, and a portion of a larva therein contained (Verhandl. z.-b. Gesell. Wien, xxxix, p. 60 [1889]). The case is from Ceylon, and Rogenhofer is no doubt correct in referring it to the *Psychidæ*, according to the larval remains and the terrestrial habitat. But it is, without doubt, the same case that I described and figured in this Magazine, vol. i, p. 125 (1864), as Trichopterous, from examples in the British Museum. I then knew nothing of the larva that formed them, nor of its habits. And holding the opinion that names should not be applied to cases or larvæ only, left them nameless.—R. McLACHLAN, Lewisham, London: *July 11th*, 1889.

Lepidoptera of Norway.—My paper from Bergen (vol. xxiv, p. 127) contains many errors, and certainly ought not to have been sent to this Magazine for publication; the only excuse is, that it was intended to give my *immediate* impression of the differences between a day's collecting in Norway, and a day in England, at the same time of the year; it was, therefore, written at the spur of the moment, without possible reference to books or specimens.

It is always unwise to speak, except very doubtfully, of uncaught insects:—"de non existentibus et de non apparentibus, eadem est ratio," there can be no proof; it would be very difficult to convince myself that I did not know such an old friend as *Satyrus Semele* when I saw it, but it seems equally hard for me to believe that the *Erebia* seen by me was "*Ligea*;" certainly, my Bergen insect seemed to me of a warmer redder-brown than the Norwegian "*Erebia Ligea*" usually is; however, it is of no use defending my eyes here—it was not possible to see a species not found in the country. With regard to *Vanessa urticae*, having had a very clear view of it settled on a flower, it seemed to be the form "*polaris*," it certainly was unusually dark, and very different from English specimens, or from those seen by me a few weeks after at Christiania; and it is as well here to mention that the darkest "*polaris*" in my collection was bred by myself from one of a large number of larvæ of *V. urticae* collected by me in the Visp Valley; however, I do not wish to shelter myself under the chance of an accidental aberration, as this undoubtedly was.

The specimen of *Pararge*, which was actually taken, shall be referred to hereafter.

I cannot in any way defend myself from a charge of carelessness in misnaming the *Chionobas*, taken at Jerkin, for *C. Norna* it undoubtedly is; I had *C. Jutta*

(both from Quebec and Norway) and *C. Norna* (from Lapland) in my collection, and the two insects ought to have been familiar enough to me; whatever was said by me of *C. Jutta*, was said in error, and must be understood as applying to *C. Norna*, and *C. Norna* only; for this, I feel indebted to Prof. Schöyen, and I am glad to have this opportunity of correcting a serious mistake.

There can be no doubt about the truth of labels, and the localities of the captured *Crambi* are, therefore, correct; *Crambus truncatellus* was taken in a swamp at Tönset; as Norway is not mentioned as one of its haunts in Dr. Staudinger's list, I was pleased to think that this was its first capture in that country, which is an evident error.—R. C. R. JORDAN, 105, Harborne Road, Edgbaston: July, 1889.

Notes from Colorado.—In my last note I spoke of Cecid. woolly galls on *Bigelovia*. The Cecids., however, were only inquilines, and I have now reared two specimens of a lovely little *Trypeta*, the true originator of the galls. It is curious about the *Cecidomyia bigeloviae*, that all the specimens raised were females, and yet a newly-emerged unimpregnated ♀, when pressed under a cover-glass for microscopical examination, extruded several eggs, which were full of an orange substance, and certainly seemed to be in process of development. Parthenogenesis has been recorded in *C. destructor*, so probably it may occur in *C. bigeloviae* also. *Rhodites rosæfolii* is certainly a new species, and I have bred three of the flies from the little flattish rose-leaf galls. They are about $2\frac{3}{8}$ mill. long, with a black head and thorax, and red-brown abdomen and legs; but a full description will appear elsewhere in course of time. The ants here have quite a European stamp, some being quite identical with those of Europe. Mr. W. H. Ashmead has recently identified *Lasius flavus*, De G., *L. alienus*, Först., and *Myrmica lobicornis*, Nyl., in a little collection of ants from West Cliff. In an ant's nest I got a Coccid, *Orthezia*, probable n. sp. I have packed some off to Mr. Douglas, and he will know all about them. Dr. Geo. H. Horn has recently identified a specimen of the European species *Crepidodera helxines*, L., among some beetles from West Cliff here.—T. D. A. COCKERELL, West Cliff, Custer Co., Colorado: June 2nd, 1889.

ENTOMOLOGICAL SOCIETY OF LONDON: July 3rd, 1889.—The Right Hon. LORD WALSHINGHAM, M.A., F.R.S., President, in the Chair.

The Rev. W. A. Hamilton, Calcutta, and Mr. H. W. Vivian, Glenafon, Taiback, South Wales, were elected Fellows of the Society.

A letter was read from Mr. E. J. Atkinson, Chairman of the Trustees of the Indian Museum, Calcutta, in which assistance was asked from British entomologists in working out various orders of Indian insects.

The following motion, which had previously been unanimously passed at the meeting of the Council, was read to the Society:—"That papers containing descriptions of isolated species widely remote in classification or distribution, are, as a rule, undesirable for publication, as tending to create unnecessary difficulties for faunistic or monographic workers." Mr. McLachlan, Mr. Jacoby, Mr. Elwes, Dr. Sharp and others took part in the discussion which followed.

Mr. J. W. Slater exhibited a doubtful specimen of *Arctia mendica*, L., which appeared as if it might prove to be a hybrid between that species and *A. lubricipeda*, L.

Mr. McLachlan, on behalf of Prof. Klapálek, of Prague, who was present as a visitor, exhibited preparations representing the life-history of *Agriotypus armatus*, Walk., showing the curious appendages of the case. Prof. Klapálek, in answer to questions, described the transformations in detail. A discussion followed, in which Mr. McLachlan and Lord Walsingham took part.

Mr. H. J. Elwes exhibited a specimen of an undescribed *Chrysophanus*, taken in the Shan States, Upper Burmah, by Dr. Manders, which was very remarkable on account of the low elevation and latitude at which it was found; its only very nearly appeared to be *Polyommatus Li*, Oberthür, from Western Szechuen, but there was no species of the genus known in the Eastern Himalayas or anywhere in the Eastern tropics.

Mr. G. T. Porritt exhibited a remarkable series of *Arctia mendica*, L., bred from a small batch of eggs found on the same ground at Grimescar, Huddersfield, as the batch from which the series he had previously exhibited before the Society was bred. This year he had forty-five specimens, none of which were of the ordinary form of the species: as in the former case, the eggs were found perfectly wild, and the result this year was even more surprising than before.

Mr. R. W. Lloyd exhibited specimens of *Harpalus cupreus*, Steph., and *Cathormiocerus socius*, Boh., recently taken at Sandown, Isle of Wight.

Mr. O. E. Janson exhibited a fine male example of *Theodosia Howitti*, Castelnau, a genus of *Cetoniidæ* resembling some of the *Dynastidæ* in the remarkable armature of the head and thorax. The specimen had recently been received from N. W. Borneo.

Mr. W. White exhibited specimens of *Heterogynis paradoxa*, Ramb., and stated that this insect represented an extreme case of degeneration, the mature female being only slightly more developed than the larva, the prolegs being quite atrophied. Lord Walsingham made some remarks on the subject.

Mr. W. Warren exhibited bred specimens of *Tortrix piceana*, L.

Mr. T. R. Billups exhibited a fine series of the very rare British beetle, *Medon* (*Lithocharis*) *piceus*, Kr., taken from a heap of weeds and vegetable refuse in the neighbourhood of Lewisham, on May 19th; and specimens of *Actobius signaticornis*, Rey, and *A. villosulus*, Steph., taken in company with the above. Mr. Billups also exhibited specimens of *Eulophus damicornis*, Kirby, belonging to the family *Cynipidæ*, bred from pupæ found by Mr. Adkin attached to the leaves of lime trees at Oxshott, Surrey, but the host was unknown.

Mr. W. F. Kirby read a paper entitled "Descriptions of new species of *Scoliides* in the collection of the British Museum, with occasional reference to species already known."

Mr. J. B. Bridgman communicated a paper entitled "Further additions to the Rev. T. A. Marshall's Catalogue of British Ichneumonidæ."

Mr. J. S. Baly communicated a paper "On new species of *Diabrotica* from South America."—W. W. FOWLER, *Hon. Sec.*

SYNOPSIS OF THE BRITISH ORTHOPTERA.

BY ELAND SHAW, F.E.S.

(Continued from p. 359).

II.—BLATTIDÆ.

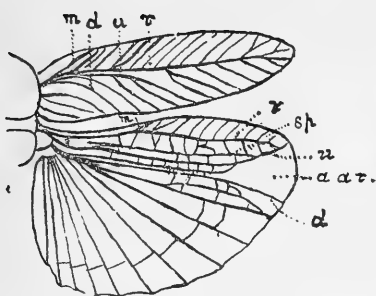


Fig 1

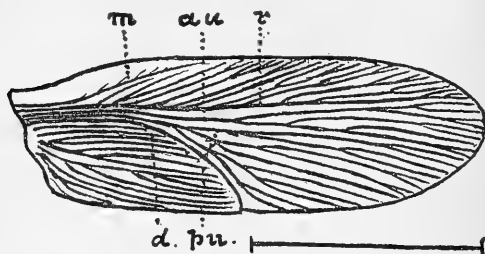


Fig 2.

Fig. 1.—Right elytron and wing of *Ectobia lapponica*, L. ♂. *m*, mediastinal vein; *r*, radial vein; *u*, ulnar vein; *sp*, spurious vein; *d*, dividing vein; *a ar*, apical area.

Fig. 2.—Right elytron of *Periplaneta americana*, L. ♂. *m*, mediastinal vein; *r*, radial vein; *a u*, anterior ulnar vein; *p u*, posterior ulnar vein; *d*, dividing vein.

The cockroaches found in Britain may be divided into two groups, 1, the indigenous species, *i. e.*, the three species of the genus *Ectobia*; 2, the introduced species. The latter are established in the country according to their date of introduction; the earliest being *Periplaneta orientalis*, the house cockroach or so-called "blackbeetle." We find the first record of its occurrence in Mouffet's "Theatrum," 1634, p. 139, where it is mentioned as common in wine cellars in London; and now it is not only generally distributed in houses, but is also found out of doors. *Phyllodromia germanica* has also spread westwards, and is plentiful in many houses, especially in London refreshment bars and bakehouses. It is said to have been brought here by the soldiers returning from the Crimean War (1857). *Periplaneta americana*, the "ship cockroach," is fast establishing itself, and *P. australasie* has also arrived, and though we have only one record of its occurrence in this country, it is found commonly in many maritime towns on the continent. The cockroach, from the nature of its food, can easily adapt itself to its surroundings, provided there is enough warmth, and this may account for its success in the "struggle for existence," and its wide distribution both in space and time. The earliest known of all fossil land animals is a cockroach, *Paleoblattina Douvillei*, Brongniart (Comptes Rendus Acad. des Sciences, Paris, No. 29, Dec. 26th, 1884).

In studying the British *Blattidæ*, the following details of structure

should be noticed. The head is carried almost hidden by the projecting anterior margin of the pronotum, *i. e.*, the dorsal plate of the first thoracic segment. The dorsal plate of the second is the mesonotum, and that of the third the metanotum; the three corresponding ventral plates being respectively the pro-, meso- and meta-sternum. The venation of the upper wings (called, for convenience, elytra) is of importance. It is simpler in this Family than in the *Acridiidae* (q. v.), and simpler in *Ectobia* than in *Phyllodromia* and *Periplaneta*. The elytron of *P. americana* (fig. 2) may be taken as an example; and here from before backwards the named veins are—the mediastinal (*m*), contiguous at the base with the radial; the radial (*r*), arising at the base and giving off branches, the position and complexity of which form useful generic characters; the anterior ulna (*a u*), and the posterior ulnar (*p u*). In *Ectobia* (fig. 1) there is only one ulnar vein, and that arises from the radial and not from the base. Lastly, there is the dividing vein (*d*), this is the “vena dividens” of Brunner, and the “vena analis” of Fischer. It curves outwards and downwards from the base to the posterior margin, the curve of which is always changed where the vein joins it. This also applies to the wing.

In the under-wings are seen corresponding veins, but the portion of the wing behind the dividing vein is very much larger than in the elytra, and when at rest, the insect carries this part folded longitudinally. In *Ectobia* there is a curious dilated hyaline area at the apex of the wing (fig. 1, *a*, *a r*), this is rather the dilated extremity of a long area which runs up to the base of the wing, and is crossed by a few transverse veinlets, which vary in number and position in different specimens. It is situated immediately above the dividing vein (*d*), but at the apex of the wing part of the hyaline area is below the dividing vein. Brunner calls this “campus apicalis triangularis;” and to avoid confusion I have called it the apical area, though perhaps ulnar area would be a better name. The drawing has been very carefully made under the microscope by Mr. G. S. Saunders. The narrow basal part of this area is partly filled up by a vein arising from the base and terminating about the middle, and the area is folded when the insect is at rest.

The femora of all the British *Blattidae* have spines beneath, though this is not the case with the continental genus *Heterogamia*; and the tarsi are 5-jointed, and without a cushion between the claws.

The extremity of the pronotum gives several important characters. The dorsal plate of the last segment of the abdomen forms the supra-anal plate, and also bears two jointed processes, the cerci. The last

ventral plate is the subgenital lamina ; this is the 9th of the abdominal sterna in the ♂ and the 7th in the ♀, and its structure is of great importance in distinguishing the genera. The subgenital lamina sometimes bears (in the ♂) a pair of pointed processes, called styles.

The *Blattidæ* deposit their eggs enclosed in a capsule, the ootheca, the form of which varies in different genera, and the ♀ carries it about for some time partly extruded.

In using the terms anterior, posterior, &c., the insect is supposed to have the wings spread out.

TABLE OF GENERA.

- 1 (4) Small size. Subgenital lamina ♀ undivided. Elytra, when present, with most of the branches of the radial vein simple (fig. 1).
- 2 (3) Supra-anal plate ♂ ♀ rounded and very narrow. Elytra, when present, with the ulnar vein contiguous at the base with the radial vein ; and the latter beyond the middle with branches on both sides. Wings, when present, have an apically dilated folding area (fig. 1, *a ar*)i. *Ectobia*.
- 3 (2) Supra-anal plate ♂ ♀ triangularly produced. Elytra with the ulnar vein free from the base ; radial vein not branching posteriorly. Wings with no apical area..... ii. *Phyllodromia*.
- 4 (1) Large size. Subgenital lamina ♀ divided into two lateral lobes. Elytra, when present, with most of the branches of the radial vein furcate (fig. 2)... iii. *Periplaneta*.

i.—ECTOBIA, Westwood (fig. 1).

This genus and *Phyllodromia* are at once distinguished by their much smaller size as compared with *Periplaneta*, and the venation of the elytra easily separates *Ectobia* from *Phyllodromia*.

Brunner includes with this the genus *Aphlebia*, Br., in the tribe *Ectobidæ*, but we have no British species of the genus *Aphlebia*, though their distribution in Europe may justify us in hoping that two of the species, *A. maculata*, Schr., and *A. punctata*, Meg., may turn up here ; they should be looked for under dry leaves, &c.

TABLE OF SPECIES.

- 1 (2) Pronotum with the disc fuscous or blackish with pale margins
1. *lapponica*, Linné.
- 2 (1) Pronotum with the disc testaceous (exc. *E. ericetorum*, var. *nigripes*).
- 3 (4) Small size, colour griseous. Elytra truncate in ♀2. *Panzeri*, Steph.
- 4 (3) Larger size, colour stramineous. Elytra longer than the abdomen ♂ ♀ ...
3. *livida*, Fabr.

1.—ECTOBIA LAPPONICA, Linné.

Blatta lapponica, Linné, Faun. Suec., p. 863 ; (*Ectobia*) Fischer, Orth. Europ., p. 105, tab. vii, figs. 13—15.

Ectobius lapponicus, Steph., Mandib., vi, p. 46, tab. xxviii, fig. 7.

Ectobia lapponica, Brunner, Prod. der Eur. Orth., p. 31, fig. 7.

Ect. perspicillaris, Turton, Steph., Mandib., vi, p. 47, non Fuessly.

Head and antennæ black. Pronotum black or dark fuscous, with the lateral margins pale and pellucid. Elytra in ♂ fully developed, testaceous, with a few brownish blotches and numerous small dark dots. Veins pale. Elytra in ♀ truncate, not reaching beyond the fourth abdominal segment. Wings fully developed in ♂, rudimentary in ♀. Legs fuscous, with the articulations paler. Abdomen dark fuscous, shining. Length, 8—13 mm.

Lapponica is readily distinguished from *Panzeri*, Steph., by its larger size, while its much darker colour at once separates it from *livida*, Fab.

This species may be looked for through the summer, probably from July to September, under dry leaves and moss, and amongst the undergrowth in woods. I have taken it in the New Forest, and it has been found in several localities in the S. E. counties.

Stephens, Mandib., vi, p. 47, describes *perspicillaris*, Fues., as British. I have examined his specimen in the British Museum, and regard it as identical with *lapponica*, L., and this seems also to have been the opinion of L. Fischer. The true *perspicillaris*, Fues., ought to be referred to *livida*, Fab.

2.—ECTOBIA PANZERI, Steph.

Ectobius Panzeri, Steph., Mandib., vi, p. 47 (1835).

Blatta ericetorum, Wesmael, Bull. Acad. Brux., v, p. 587, tab. i, fig. 2 (1838); (*Ectobius*) Fischer, Orth. Europ., p. 110, tab. vii, figs. 19, 20.

Ectobia ericetorum, Brunner, Prod. der Eur. Orth., p. 34.

Bl. germanica, Panzer, Faun. Ins. Germ., ii, fig. 17.

Ect. nigripes, Steph., Mandib., vi, p. 48 (var.).

Head and antennæ fuscous, vertex pale between the eyes. Pronotum testaceous, with clear margins, and several dark markings on the disc, and a pale central streak running from before backwards. Elytra pale with numerous dark spots; lanceolate and longer than the abdomen in ♂; truncate in ♀, not reaching beyond the third abdominal segment. Wings in ♂ smoky, in ♀ rudimentary. Legs testaceous, with fuscous markings. Abdomen pale fuscous, with several rows of black dots above. Larva with a blackish triangular mark occupying the pronotum and mesonotum, and with its base at the posterior margin of the mesonotum, metanotum with the posterior border blackish. Length, 6—9 mm.

June and July. Mr. E. Saunders has taken this species at Hayling Island and Deal, and Stephens gives localities on the South Coast and Lyndhurst. It occurs in sandy districts, and seems commonest on the shore sandhills.

Wesmael's name, *ericetorum*, is in use amongst continental authors, but as Stephens' name has the prior right, I have adopted it. The form occurring in this country is darker than that from middle and South Europe, and the var. *nigripes*, Steph. (q. v.), is much darker still.

var. *nigripes*.—Steph. (Mandib., vi, p. 48) describes this as a distinct species. Fischer queries it as synonymous with *ericetorum*, Wesm., and Brunner v. Wattenwyl gives it as synonymous with *lapponicus*, L. A short time since I sent a couple of specimens to Herr Brunner v. Wattenwyl, who says, in reply, that they agree entirely in form with *ericetorum*, Wesm., but in colour are much darker than any he has seen, and that this species, in common with other *Blattidæ*, tends to get darker in colour when occurring in more northern localities, his specimens from Spain and Dalmatia having straw-coloured elytra and pronotum.

Nigripes is very much darker generally than *Panzeri*, but the pale vertex is not lost and shows up more distinctly. The pronotum, even in the darkest specimens, retains at least part of the central pale streak. The legs are pitchy-black, with the pale apex of tibia and base of tarsus plainly visible.

Stephens gives the New Forest and Dorsetshire; my specimens are from Bournemouth; and Mr. G. T. Porritt took it last year at Lelant, in Cornwall.

3.—ECTOBIA LIVIDA, Fab.

Blatta livida, Fab., Ent. Syst., p. 10; (*Ectobius*) Fischer, Orth. Europ., p. 107, tab. vii, figs. 16—18.

Ectobia livida, Brunner, Prod. der Eur. Orth., p. 35.

Bl. pallida, Olivier, Enc. Méth., iv, p. 319.

Ect. pallidus, Steph., Mandib., vi, p. 48.

Generally straw colour. Head and antennæ rather darker. Eyes blackish. Pronotum rufo-testaceous, with clear margins and a few dark dots. Elytra lanceolate, with a few dark dots, and reaching beyond the apex of the abdomen ♂ ♀. Legs pale. Abdomen ferruginous or fuscous. Cerci testaceous, with dark markings; in the larva with the tips blackish. Length, 9—13 mm.

This cockroach I have taken in the New Forest under dead leaves in September, and have specimens from Bournemouth and Ruislip, the latter taken by Mr. McLachlan (August). Stephens gives Darenth Wood and Birch Wood (*lividus*), and Devonshire and New Forest (*pallidus*). Mr. Saunders takes it at Woking.

Stephens (Mandib., vi, p. 48) describes *pallidus* as a distinct species. I have examined what are believed to be his types in the British Museum, and think them a rather dark form of *livida*, Fab.

REPUTED SPECIES.

Ectobius pallens.—Stephens (Mandib., vi, p. 46) describes this species from a single dried specimen, which had been "taken near London," and Fischer (Orth. Eur., p. 106) queries it as synonymous

with *lapponicus*, L. I have examined Stephens' specimen which is in the British Museum, and it is not an *Ectobia*, but a *Phyllodromia*, and I should think it probably a stray exotic species, as *P. germanica*, L., is the only European representative of the genus.

ii.—PHYLLODROMIA, Serville.

Distinguished from *Ectobia* by the absence of the dilated apical area and the form of the supra-anal plate; also in this genus the ulnar vein, instead of arising from the radial vein, comes separately from the base, and the radial vein branches only anteriorly.

1.—PHYLLODROMIA GERMANICA, Linné.

Blatta germanica, Linné, Syst. Nat., ii, p. 688; (*Ectobius*) Fischer, Orth. Europ., p. 112, tab. vii, fig. 21.

Phyllodromia germanica, Serv., Orth., p. 107; Brunner, Prod. der Eur. Orth., p. 46, fig. 9.

Head ferruginous, paler behind the vertex and below the insertion of the antennæ. Antennæ testaceous. Pronotum testaceous, with two blackish-brown longitudinal bands, which do not quite reach either the anterior or posterior margin, and are prolonged backward over the mesonotum. Elytra unicolorous, lanceolate. Wings smoky towards the costa. Legs testaceous. Abdomen testaceous, with some fuscous markings above, darker below. Cerci long. Length, 14—15 mm.

Egg capsule oblong, with more strongly marked angles than in *Periplaneta*, and with the opening at the side, not dorsal as in *Periplaneta*.

This species is found in woods in Central Europe, and has taken up its abode in many houses. In England I have found it in many London restaurants, and in some of the houses in the Zoological Society's Gardens. Wherever it is found it is in large numbers.

iii.—PERIPLANETA, Burmeister (fig. 2).

This genus, which includes the common house cockroach, is at once distinguished by the large size of the species. The subgenital lamina is divided into lateral lobes, and these embrace the egg capsule, which has its long diameter perpendicular instead of transverse, as in *Phyllodromia*. The branches of the radial vein are mostly branched (fig. 2), and the two ulnar veins arise separately from the base.

TABLE OF SPECIES.

- 1 (2) Elytra and wings in ♂ perfectly developed, truncate at the apex. In ♀ rudimentary.....1. *orientalis*, Linné.
- 2 (1) Elytra and wings in both sexes fully developed, longer than the abdomen.
- 3 (4) Elytra unicolorous2. *americana*, Linné.
- 4 (3) Elytra with a broad yellow streak between the mediastinal vein and the marginal vein3. *australasiæ*, Fabr.

1.—*PERIPLANETA ORIENTALIS*, Linné.

Blatta orientalis, Linné, Fauna Suec., No. 862; Syst. Nat., ii, p. 688.

Periplaneta orientalis, Burmeister, Handb., ii, p. 504; Fischer, Orth.

Europ., p. 114, tab. vii, figs. 22—26; Brunner, Prod. der Eur.

Orth., p. 49.

Head, thorax, and abdomen of a uniform dark chestnut-brown, paler where covered by the elytra. Elytra and wings in ♂ fully developed, subtruncate at the apex, not covering the abdomen. Wings ferruginous anteriorly, hyaline posteriorly subtruncate at the apex. In ♀ elytra lobiform, with the veins indicated. Wings, rudimentary. Legs ferruginous. Supra-anal plate in ♂ nearly straight posteriorly; in ♀ produced into two lobes, divided by a deep notch. Egg capsule with the suture dorsal. Length, 20—25 mm.

This cosmopolitan species is ubiquitous.

2.—*PERIPLANETA AMERICANA*, Linné (fig. 2).

Blatta americana, Linné, Syst. Nat., ii, p. 687.

Periplaneta americana, Burm., Handb., ii, p. 503; Fischer, Orth. Eur.,

p. 116; Brunner, Prod. der Eur. Orth., p. 50, fig. 11.

Of a general ferruginous colour. Pronotum with a pale band within the margin, most marked posteriorly and laterally, sometimes continued all round. Disc of the pronotum ferruginous, fading into the yellow band, and sometimes divided into two portions by a pale process running backwards from the band. Elytra and wings longer than the abdomen in both sexes. Elytra in ♂ acuminate, in ♀ slightly truncate at the apex. Supra-anal plate in both sexes triangularly notched, pellucid in ♂, ferruginous in ♀. Egg capsule ferruginous, with the suture dorsal.

Length, 28—40 mm.

This cockroach is a pest on board many ships, and is found in warehouses in most continental ports. In England I have seen it in abundance in some of the houses of the Zoological Society's Gardens, and have heard of its occurrence in warehouses in London, Dover, Goole, &c. As its name implies, it is a native of America.

3.—*PERIPLANETA AUSTRALASIE*, Fabr.

Blatta australasiæ, Fabr., Ent. Syst., ii, p. 7.

Periplaneta australasiæ, Fischer, Orth. Europ., p. 117.

Head chestnut-brown, with a yellow ring surrounding the insertion of the antennæ, and a small longitudinal yellow dash between the eyes. Pronotum chestnut-brown, with a bright yellow band within the margin, running all the way round, but broadest posteriorly, yellow band distinctly separated from the dark part of the pronotum. Elytra dark ferruginous, with the space between the mediastinal and marginal veins yellow; the rest of the elytra unicolorous, reaching beyond the apex of the abdomen. Legs ferruginous, femora somewhat pale. Supra-anal plate deeply notched posteriorly, with a central longitudinal ridge. Cerci dark ferruginous.

Length, about 30 mm.

This species is, perhaps, a native of Australia. Von Borck (Skand.

rätv. Ins., I, i, 35, 1848) notices it from Sweden. Mons. G. A. Poujade, of Paris, told me that it occurs in considerable numbers in many maritime towns in Europe. In Britain it has occurred in Belfast (McLachlan, Ent. Mo. Mag., xxiii, p. 235), and will probably gradually establish itself here. It also occurs in Florida.

REPUTED SPECIES.

1.—*Panchlora maderæ*, Fab.—Stephens (Mandib., vi, p. 43) says this species has been frequently taken in London, and doubtless only wants looking for about the docks. I have not seen any recent notices of its capture. Bolivar (Ortóp. de Esp.) records it from the arsenal at Ferrol.

2.—*Blabera gigantea*, L.—Another exotic species, probably imported into this country amongst West Indian merchandise, and found in the West India Docks (*vide* Steph., Mandib., vi, p. 43), but which can only be looked upon as at best a casual visitor.

(*To be continued*).

ON THE GENUS *CENOLOBA*, WLSM.

BY E. MEYRICK, B.A., F.E.S.

This genus was formed by Lord Walsingham (Ent. Mo. Mag., xxi, 175) for the reception of *obliteralis*, Walk., from examination of the single poor type in the British Museum. The species in question is an Australian *Pterophorus*-like insect, with fore- and hind-wings alike deeply cleft into two feathers, and was regarded by Lord Walsingham as belonging to the *Pterophoridae*. The characters given by Lord Walsingham are very incomplete, but in my paper on the classification of the *Pterophoridae* (Trans. Ent. Soc. Lond., 1886, 2 & 11) I intimated that they were such as rendered the correctness of that location very doubtful. The species has since been rediscovered in the neighbourhood of Brisbane by Dr. T. P. Lucas, to whom I am indebted for specimens; and from examination of these I am able to say positively that the genus does not belong to the *Pterophoridae* at all, but affords an interesting and curious example of cleft wings occurring in another family of *Pyrallidina*. It tends, therefore, incidentally to support the arguments by which I have endeavoured to show that the *Pterophoridae* are justly to be referred to that group.

The following are the full generic characters:—

CENOLOBA, Wlsm.

Forehead rounded, with appressed scales; ocelli present, very small; tongue developed. Antennæ three-fourths in ♂ serrate, moderately ciliated (1). Labial

palpi long (3), straight, porrected, second joint with dense roughly projecting scales, terminal joint moderate, slender, cylindrical. Maxillary palpi long (about half labial), porrected, triangularly dilated with loose rough scales. Abdomen in ♂ with moderate anal tuft, claspers rather slender, uncus not developed. Posterior tibiæ with outer spurs three-fourths of inner. Fore-wings elongate, narrow, gradually dilated throughout, hind-margin once deeply cleft to one-half, segments elongate-lanceolate; vein 1 simple, 2 out of 3, 4 from point with 3, running to apex of second segment, 5 and 6 obsolete, 7 closely approximated at base to 9, 8 out of 9, 9 running to costa near apex, 10 out of 9 below 8, 11 out of 9 near origin, 12 free. Hind-wings elongate, gradually dilated, hind-margin once deeply cleft to two-fifths from base, segments elongate-lanceolate; lower median vein without basal pectination; 1a, b, c all present, 2 from before angle, 3 and 4 stalked from angle, 5 short, running to base of cleft, 6 from angle of cell, 7 out of 6 near origin, anastomosing with 8 to its middle, 8 running to costa near apex.

Compare with the above the family characters of the *Pterophoridae*, as follows:—

No ocelli. No maxillary palpi. Abdominal uncus in ♂ well developed. Fore-wings with vein 7 separate or absent. Hind-wings with vein 6 separate from 7, 8 free but closely approximated to 7 on cell, lower median not pectinated. Wings usually fissured.

Here, out of eight permanent characteristics of the family, no less than five are found wanting in *Cenoloba*. These are probably not all of equal value; but the presence of highly-developed maxillary palpi, and the different structure of veins 6, 7, 8 of the hind-wings, are of the highest importance, and may be accepted as an absolute bar to the inclusion of this genus in the *Pterophoridae*. It will of course be also remembered that the fissure of the wings, though superficially similar, proceeds on a different basis, for in no other genus of *Pterophoridae* are the hind-wings divided into two segments only.

I am fortunately able to indicate the true immediate affinity of this curious genus. It is, without doubt, a direct development of the peculiar West Australian genus *Epharpastis*, Meyr. (Trans. Ent. Soc. Lond., 1887, 203), agreeing well with it not only in main points of structure, but in superficial appearance and peculiar character of markings. *Epharpastis* has not the wings fissured, but their hind-margin shows a well marked concavity which is clearly the origin of the fissure. Less closely connected, but certainly allied genera, are *Tineodes* and *Oxychirotia*, both also Australian. These four genera form a group, hitherto regarded by me as divisible into two families, but perhaps now capable of being united into one, for which the name *Oxychirotidae* may be retained. Doubtless other allied genera may be discovered; but it is probable that there now exist only the remains of a once rather extensive group, including some of the earliest forms of the *Pyralidina*, and showing almost equal relationship to the *Alucitidae*, *Pterophoridae*, *Scopariadæ*, and *Hydrocampidæ*.

Ramsbury, Hungerford:

June 24th, 1889.

NOTES ON ANT'S-NEST BEETLES AT GIBRALTAR AND TANGIER;
WITH ESPECIAL REFERENCE TO THE *HISTERIDÆ*.

BY J. J. WALKER, R.N., F.E.S.

Among the numerous species of *Coleoptera*—about 1800, at a moderate estimate—which were collected by me on both sides of the Straits during my recent stay of two years and a half at Gibraltar in H.M.S. “Grappler,” the *Myrmecophila* were, I think, my chief favourites. I was stimulated to give special attention to them, first, by the discovery at Tangier, in March, 1887, of a very fine and distinct species of *Sternocælis*, which has since been described by Mr. Geo. Lewis under the name of *S. acutangulus* (Ent. Mo. Mag., vol. xxiv, p. 164), and subsequently by the wonderful series of ant’s-nest *Histers* captured by that gentleman in the same locality in the spring of 1888, which he was kind enough to show me when passing through Gibraltar. The lucid and admirable paper “On the capture of Formicarious Histeridæ” since published by him (“Entomologist,” vol. xxi, p. 289, *et seq.*) almost exhausts the subject of the habits of these marvellous little beetles, and the following notes, as far as the *Histeridæ* are concerned, must be regarded as mainly supplementary to that paper.

Of the four species of Myrmecophilous *Histeridæ* which came under my notice, all were found exclusively with ants of the genus *Aphænogaster*, living under stones, and almost entirely with one species, viz., the black, pubescent *A. testaceo-pilosa*, Lucas. Curiously enough, however, the very first “ant’s-nest *Hister*” I ever saw alive—the original specimen of *Sternocælis acutangulus*, Lewis—occurred at Tangier in a small nest of the bright red *A. sardoa*, Mayr, and on one subsequent occasion only, I found both *S. acutangulus* and *Eretmotus tangerianus*, Mars., with the same ant. The commonest species appears to be *S. arachnoides*, Fairm., which is by no means rare near Tangier, though I did not meet with it in such numbers as did Mr. Lewis: this species occurred only on the African side of the Straits, while the little *S. fuscus*, Schmidt, was only found very rarely near Gibraltar, being apparently represented at Tangier by the allied *S. mauritanicus*, Lewis, a species I did not obtain. *Sternocælis acutangulus* and *Eretmotus tangerianus* occur both at Tangier and Gibraltar.

Although *Aphænogaster testaceo-pilosa* is a generally distributed and very abundant ant throughout the district, according to my experience it was of no use searching its nest for *Coleoptera* of any kind, except on the stiffest clay soil, which, near Gibraltar, is limited to two small spots—one at the western foot of the Sierra Carbonera, near the village of Campamento, and within easy walking distance of

the Rock, the other near the Sierra Lorca, some three miles beyond San Roque. Another very good-looking place, which I was unfortunately able to visit on but few occasions, is the low undulating country behind Algeçiras, where, on March 16th of this year, I found seven specimens of *S. acutangulus* in one small nest. At Tangier the clay soil is more predominant, especially near the massive ruins of Tingis or "Old Tangier," three miles east of the present town, which locality was kindly indicated to me by Mr. Lewis. A large amount of moisture is necessary to a successful search, as in fine dry weather any number of nests might be examined without finding a single *Hister* in them, while a sunny afternoon, after recent rain, was sure to produce one or more specimens. The greatest haul I ever made in one day was at Tangier, on December 20th, 1888—a day of cold wind and almost incessant driving rain—when I took twenty-four specimens of ant's-nest *Histers*, including nine *Eretmotus tangerianus*.

The presence of larvæ or pupæ in the nests is also essential to that of the *Histers*, and as the ants disappear from under the stones when the hot weather sets in, and retire to cooler places, it is useless to look for their attendant *Coleoptera* between May and October. I have, it is true, found thriving nests of *Aphænogaster testaceo-pilosa*, full of "brood" as early as October 27th, but have not met with any *Histers* before November 17th; the latest date on which they have occurred to me is May 14th, when I found one or two *S. arachnoides* with very mature pupæ of the ant; the soil (at Tangier) being then baked almost as hard as a brick by the sun. February and March appear to be the months in which they may be looked for with the greatest prospect of success.

The search for ant's-nest *Histers* entails no small amount of patience and exertion, as I do not think that more than two or three per cent. of the ant's nests contain them, and the stones (which it is as well invariably to turn as gently as possible, and to carefully replace after investigation) are often of great size and weight. Still, it is a pretty sight, and one which compensates for a great deal of strain to the eyes, as well as to the back, to see a *Sternocælis* or *Eretmotus* lying motionless among the hurrying crowd of ants, and then suddenly developing an amount of leg quite surprising in so small a creature, marching off daintily on the tips of its toes (or rather tarsi) with a ludicrous resemblance, in its gait and appearance, to a tiny crab. As Mr. Lewis suggests (*l. c.*, p. 291) the ants appear to regard these intruders with a certain amount of philosophic indifference, as "an evil which they are unable to divert:" their comparatively weak mandibles

being ineffective against the hard armour and tightly packed limbs of the beetles, which devour the helpless "brood" with impunity. I have more than once taken *S. acutangulus* with a half-eaten larva in its jaws, and they are usually to be found clinging to the masses of larvæ where these lie thickest. On the other hand, I once (but once only) saw an ant take up a *S. arachnoides* in its mandibles and carry it off into a lower gallery of the nest, but this may have been done under the influence of alarm, the frightened ant seizing on the first object that came in its way.

I have never found the *Histers* in any of their preparatory stages, but having occasionally come across somewhat immature specimens of *S. acutangulus* in the ant's nests, I am inclined to the idea that the larvæ, like the perfect insects, will eventually be found there. The beetles usually occur singly, or at most two or three in one nest, but, occasionally, several species are found together. Thus, on Dec. 28th, 1888, I found, in a not very populous colony of ants, three *S. acutangulus*, one *S. arachnoides*, and four *Eretmotus tangerianus*—in all eight specimens. I have also taken half a dozen *S. arachnoides* from a single nest, this species being apparently (as Mr. Lewis has also observed) more gregarious in its habits than the others.

After heavy winter rains, the *Sternocæli* are sometimes to be found in flood rubbish, along with a host of other beetles. It was in this way that I first obtained the then undescribed *S. fuscus*, Schmidt, on January 10th, 1888; but it was not until nearly two months later that I found one specimen "at home" with *Aphænogaster testaceo-pilosa* in the locality near the Sierra Lorca. It was in the same spot, in March, 1888, that I found *Eretmotus tangerianus*, at that time, I believe, new to the European Fauna; a few more specimens of this interesting species were obtained at the Sierra Carbonera in the spring of 1889, but it appears to be much rarer there than at Tangier. I have never seen any of the species on the wing, or travelling in any way in search of fresh quarters, as Mr. Lewis (*l. c.*, p. 294) has met with the *Eretmotus* at Tangier; but I imagine they must fly sometimes, as the only specimen of *S. acutangulus* which I found on the Rock of Gibraltar was shaken out of a dry tuft of grass on a stony slope, where it could hardly have been washed down by the rain, and where there were no ants within a long distance, as far as I could ascertain.

The only other beetle which appears regularly to inhabit the nests of *Aphænogaster testaceo-pilosa* is the black *Dinarda nigrita*, Rosenh. This insect was not observed at Tangier, but it is no rarity in the Gibraltar district, half a dozen specimens being often found with one

colony of ants. It is usually seen clinging to the under-side of the stone when raised, with the hind body turned up over the back, and it runs with great speed when disturbed. A fine *Aleochara (crassicornis)*, Lac.) has occurred, but very rarely, with this ant at Gibraltar and Tangier, in early spring; and stray specimens of *Coluocera formicaria*, Mots., and *Thorictus gallicus*, Peyr., are occasionally met with, the latter looking, at the first glance, deceptively like a small *Sternocælis*.

The large, powerful, and abundant ant, *Aphænogaster barbara*, L., is the host of several very interesting species of *Coleoptera*, though I have never found any *Histeridæ* in its nests. The chief of these guests is the minute and very anomalous Carabid, *Pseudotrechus mutilatus*, Rosenh., which I first observed at Gibraltar in November, 1886. It is a truly Myrmecophilous insect, being invariably associated with this ant, except when found accidentally in flood rubbish; its chief resort being the sinuous galleries excavated by the ants in the soil beneath the stones, though it is not rarely seen running actively on the under-side of the stone itself. The *Pseudotrechus* seldom occurs singly, two to three specimens usually occurring in one nest, but I do not remember to have found more than half a dozen in a single colony. It is found throughout the winter months, being, perhaps, most numerous in February; and is generally, though sparingly, distributed on the clay soils near Tangier and Gibraltar, and I have also met with it at Esmir, about twelve miles south of Ceuta, in Morocco.

The singular little flat, oval, yellow Heteromeron, *Oöchrotus unicolor*, Luc. (which reminds one of a large *Leptinus*), is the most common ant's-nest beetle throughout the district, and is entirely confined to the nests of *A. barbara*, where it sometimes occurs in very large numbers, especially when there is a quantity of loose *débris*, husks of grass seeds, &c., in the galleries of the nest. With it, also frequently in some numbers, is found the little *Coluocera formicaria*, Mots.; also two species of the singular genus *Merophysia*, the smaller of which (apparently undescribed) is restricted to the nests of this ant; the larger one, *M. carinulata*, Rosenh., is found also with many species of the smaller ants, always excepting the two species of *Cremastogaster*, whose sickly and disagreeable odour (recalling that of butyric acid) seems to be repulsive to insects of all sorts, and even to the woodlice so frequently found in other ant's nests. Two species of *Staphylinidæ*, *Kraatzia lævicollis*, Rey, and *Homalota elongatula*, Gr., occur somewhat sparingly in the *barbara* nests, where also I have, on one or two occasions, found *Xantholinus longiventris*, Heer, var., and the rare *Medon seminiger*, Fairm.

At Malaga, I have taken several specimens of a species of *Catopomorphus* with *A. barbara*, and also found a single specimen of this beetle on the summit of the Djebel Mousa (Ape's Hill), Morocco, at

an elevation of over 2800 feet, but the species apparently does not occur either at Gibraltar or Tangier.

Besides an occasional straggler of *Merophysia carinulata*, Mots., the populous colonies of the big-headed, pale testaceous *Pheidole megacephala*, F., appear to give shelter to but one species of *Coleoptera*, the extraordinary *Paussus Favieri*, Fairm. This beetle was found very soon after my arrival at Gibraltar, and in some localities (near Campamento for instance) it may be called abundant, as I have taken as many as twenty specimens from a single nest; it appears to be found equally on sandy or clayey soils. There is much in its general aspect which recalls that of *Claviger* on an enlarged scale, but it is an even more sluggish creature, being found motionless where the ants are most densely clustered, and apparently an object of entire indifference to them; though, as far as I can ascertain, it preys on the "brood" of the ants like the *Sternoceli*. Indeed, I have never observed, with these southern ants, anything at all resembling the solicitude shown towards their Coleopterous inmates, as is exhibited by our species towards *Atemeles* and *Claviger*, for instance. The *Paussus* is found at Tangier, but is not so abundant there as at Gibraltar.

This exhausts the list of Myrmecophilous beetles which I have observed in the region of the Straits of Gibraltar; and the other ants appear to have no guests but the common *Merophysia*, with the exception of the rare and singular *Anochetus Ghilianii*, Spin., whose small colonies seem usually to be quite free from beetles. On one occasion, however, at Tangier (December 9th, 1887), I found *Pseudotrechus*, *Oöchrotus*, *Coluocera*, *Merophysia*, and *Medon seminiger*, Fairm., all out for a walk together in the warm sunshine, on the top of a stone, which covered an unusually large nest of this ant.

My best thanks are due to Mr. Geo. Lewis for the determination of the *Histeridæ*, and to Dr. Sharp for that of the remaining *Coleoptera*, also to Mr. Edward Saunders for the names of the ants mentioned in this article.

23, Ranelagh Road, Sheernees :
July 27th, 1889.

NOTES ON SOME NEW AND RARE BRITISH DIPTERA.

BY CORYNDON MATTHEWS, F.E.S.

The species of flies enumerated in the following notes have all been taken by me in the woods close to this house, which is situated on the southern slope of Dartmoor, at an elevation of about five hundred feet above the sea, from which it is distant at the nearest point about seven miles; the wood extends over an area of possibly two hundred acres, and a large portion of it, which, from the nature of the ground, can never have been cultivated, is covered by scrub

oak, and sallow, with a few firs and forest trees, and furze, heather, and bilberry (*Vaccinium myrtillus*) in the open spaces. In recording an insect as a new British species, I have been guided by the list of British *Diptera* published by Mr. G. H. Verrall last year.

ALLOCOTOCERA PULCHELLA, Curt.

One ♀. This insect puzzled me entirely, and was referred to Mr. Verrall, who says that he thinks it is the first female ever taken; he states that about 1837 Curtis described and figured *Leia pulchella*; next, Walker, in 1856 (*Ins. Br. Dipt.*, iii), noticed it under the same name; then nothing more was heard of it until 1885, when it was re-described by Dziedziaki as *Eurycera flava*; in the following year, Mik pointed out that the genus *Eurycera* was pre-occupied and proposed *Allocotocera*. The specimen referred to was taken on July 22nd, 1888.

AMALOPIS (LIMNOBIA) OCCULTA, Meig.

This fly was first taken in England by Mr. Verrall, during a visit to me, in September, 1887, and was mentioned by him in the *Ent. Mo. Mag.*, vol. xxiv, p. 111. I took it again in large numbers in the following May, so that it appears to be double-brooded; it only occurs on one damp bank over an area of a few square yards.

CHILOSIA MUTABILIS, Flin.

One pair. The male taken in July, and the female in June, 1888; this insect is given in italics in Mr. Verrall's list, implying that it is doubtfully British.

SYRPHUS NITENS, Zett.

One ♂ only, taken on July 24th, 1887; this insect is inserted with a ? in Mr. Verrall's list.

SYRPHUS EXCISUS, Zett.

Two ♂s taken in July, 1887, one ♀ in July, 1888. This fly is not included in Mr. Verrall's list, but my specimens have been referred to him, and he believes them to belong to this species.

ERISTALIS CRYPTARUM, F.

One pair, taken on May 22nd of this year; Major Yerbury, R.A., has also shown me another pair taken here by him about the same date. Given in italics in Mr. Verrall's list.

SERICOMYIA LAPPONA, L.

Up to the present year, I have only taken one specimen, but this year some twenty or thirty have been taken here by Major Yerbury and myself.

THERIA MUSCARIA, Meig.

One pair; the ♀ in July, 1887, the ♂ in June, 1888. The ♀ was sent to Dr. Meade, who mentioned it in the *Ent. Mo. Mag.*, xxv, p. 27. This fly is new to Britain, and these two are, I believe, the only recorded specimens; it appears to be widely dispersed on the continent, though everywhere rare.

CONOPS STRIGATUS, Meig.

One pair. The ♂ taken August 27th, 1887, the ♀, August 28th, 1888. In vol. i of the *Insect. Brit. Diptera*, Walker says, in reference to this species: "A single specimen (male) was found by Alfred Furlong, Esq., near Killarney, in the summer of 1850." Mr. Verrall has a male given to him by Mr. D'Orville, of Exeter.

Erme Wood, Ivybridge,
S. Devon: July 27th, 1889.

ON *SCOLOPOSTETHUS ADJUNCTUS*, D. & S.

BY JAMES EDWARDS, F.E.S.

Having had the good fortune to meet with a male example of this species, as defined at p. 279 *ante*, I wish to point out some additional differences, beyond the presence or absence of tubercles, in the structure of its mesosternum as compared with *S. affinis*. In the former the mesosternum has a distinct longitudinal channel before the middle coxæ, and the comparatively smooth round space on each side is dull by reason of its exceedingly fine sculpture, while, in the latter, the mesosternum has a smooth, shining, impunctate space on each side, and there is no channel before the middle coxæ. The specimen in question has been submitted to Mr. Saunders, who admits that it possesses the characters which I assign to the species.

I should like to take this opportunity to make a few remarks on Mr. Saunders' notes on my paper on this genus.

I have shown that we have, in Britain, six kinds of *Scolopostethus*, and until it has been shown that in an average gathering of these insects the exceptions to the characters laid down in my table amount to something more than an occasional aberration, I think that such characters may reasonably be regarded as good. In the absence of proof to the contrary, I am content to treat our six kinds of *Scolopostethus* as distinct species. The whole question does not seem to me to be one of wisdom or otherwise, but simply whether the characters employed in my table are sufficient for the separation of the several kinds of *Scolopostethus* which occur in this country, and whether I have included any which do not occur here.

As Mr. Saunders did not examine the apical lobe of the style of *S. punctatus* under similar conditions to myself, he is, I take it, scarcely in a position to criticize either my figure or my statement that under a one-third objective the surface of the terminal lobe is apparently perfectly simple. Most natural objects, possessed of the three dimensions of length, breadth and thickness, present a different form under the least change of aspect, but I think that the differences shown in my figures can scarcely be more due to difference of aspect than of form, for the following reasons. The styles figured are mounted on card as nearly in the same relative position as the differences in their contour will admit, they were all drawn at the same sitting, by the same means, and under the same amplification, viz., a one-third objective, which I found to be the highest power that would give a view of the entire style at one time.

I have examined the male genitalia in some hundreds of *Hemiptera*, in which dimorphism in the organs of flight exists, chiefly *Cicadina* it is true, but I have not, in a single instance, found that differences in the form of the styles are in any way correlated to the development of the elytra and wings.

131, Rupert Street, Norwich :

June 15th, 1889.

[The specimen sent me for examination by Mr. Edwards certainly agrees with *S. adjunctus* as described by him, but it does not agree with *adjunctus*, Put. (sec. specimen lent me by that author), as it has the coarsely punctured prosternum of *affinis* and *punctatus*, whereas, in Puton's *adjunctus* the prosternum is finely punctured as in *decoratus*, Hahn. Neither, following Mr. Edwards' views, can it be *adjunctus*, D. & S., as it certainly is not *decoratus*, Thoms., since it has the much curved front tibiæ as in *affinis*, Schill, whereas Thomson says of his *decoratus* "tibiis anticis ♂ apice leviter incurvo." I must leave it to Mr. Edwards as to whether a seventh species should be created, such specimens only increase my doubts as to the existence in this country of more than one. One word as to *punctatus*, Edw., and *affinis*, Schill. I examined the styles of both of these under a $\frac{1}{4}$ -inch objective, and could see no difference in the length and size of the hairs on them; had I submitted both to a one-third (which, unfortunately, I do not possess) I should, I fancy, have seen these hairs on both, if not, I could not have seen them on either, so that I do not appreciate how the power of the lens could have influenced the situation. As to the form of the styles all I can say is that I examined them in every position I could with great care, and came to the conclusion that they were alike. Mr. Edwards thinks they are not; to explain how I thought he had been misled, I suggested that he had viewed them under different aspects, he feels sure he has not, here I suppose we shall not agree. I quite accept his remarks as to correlation of alar development and armature; if one is not influenced by the other in the *Cicadina*, it is probable that it would not be so in the *Heteroptera*.—EDWARD SAUNDERS, St. Ann's, Woking.]

Diasemia Ramburialis at Portland.—I am glad to be able to record the capture of one specimen of the above at Portland on July 11th by myself. While collecting in a grassy hollow it buzzed up out of the long grass and alighted in a bramble bush from which, with some difficulty, I extracted it. This is, I believe, the first record of *D. Ramburialis* occurring in Dorsetshire.—C. R. DIGBY, Studland Rectory, Dorset: July 22nd, 1889.

The larva of Coleophora vulnerariæ.—Whilst at Walmer, last year (1888), I came across specimens of *Coleophora vulnerariæ*. This was late in July, and they were then in rather poor condition and most of them females, flitting about from flower to flower of *Anthyllis vulneraria*, doing their last duties of oviposition. It was, no doubt, much too late for the moths in an ordinary season, so that this summer I visited the place at the end of June, expecting to be in good time. It was none too soon, however, for the *Coleophoræ* I found had evidently been out some while, and were again chiefly females. A number of these I secured on to potted

plants of the *Anthyllis*, and at intervals, two or three weeks later, also collected a quantity of the flower heads from different places in the neighbourhood. The larvæ quickly appeared, and are unquestionably seed-feeders. The case is formed of the calyx with *occasionally* the remains of the floweret attached. Larvæ were noticed from time to time crawling about *without* cases, so that they probably move from one seed to another until full-fed, when the case is assumed. Those with cases that have crawled up are now tightly secured to the muslin, and have apparently done all they intend to do. I have no doubt the time of appearance of the moth is when the *Anthyllis* comes into flower, generally about the middle of June; and as it is a common plant, along the sea coast especially, the insect will probably be found to occur in many other places.—G. W. BIRD, Honor Oak Park, S.E.: Aug. 10th, 1889.

Gelechia atrella in *Hypericum* stems.—In reply to your enquiry at p. 318 of this volume, I may say I have noticed stems of *Hypericum* which had been attacked by *G. atrella* each year since 1880, when my attention was directed to them by specimens forwarded me by Mr. Jeffrey. Last year I bred two specimens from the few I brought home.—SYDNEY WEBB, Dover: July 1st, 1889.

Thecla Alcestis.—On p. 300 (June No.), Mr. H. Grose Smith describes a new species as *Thecla Alcestis*. There is, however, already a species of this name found in Texas and Arizona (*T. Alcestis*, Edw., Trans. Am. Ent. Soc., 1871, p. 271). So the Solomon Island species will need a new name. I point this out as mistakes of this kind are always best corrected at once.—T. D. A. COCKERELL, West Cliff, Colorado: June 20th, 1889.

Asymmetry in Insects.—The opposite wings, &c., of insects, although generally alike, are quite often more or less dissimilar—much more often than would be supposed from the comparatively few published records of such instances. Sometimes, in the case of dimorphic species, one side is of one variety, and one of the other; sometimes the one side is in perfect agreement with the male, and the other with the female—a complete division down the middle of the insect; more frequently the asymmetry is only of slight degree, as in the number or size of ocelli. I have collected records of a number of such cases of asymmetry, and it *appears* that (1) the left side is the one most generally aberrant from the type; (2) this aberration is most *often* in the direction of arrested development. The object of this note is to seek further evidence in the matter, and it is *possible* that these apparent laws are the result of pure coincidence.—ID.

Coccus cacti in *Colorado*.—I was astonished the other day to find *Coccus cacti* ♀, on *Opuntia missouriensis*, eight miles from here, at 8,400 feet above the sea. I had no idea the species would live at such an altitude, and where the temperature is often far below zero in winter. I had only found the species before in Madeira, where it was common on *Opuntia Tuna*.—ID.: July 25th, 1889.

Intermittent development and conditions of insect-life in Australia.—After a drought, which lasted nearly thirteen months, we have been blessed with heavy rains, causing the vegetable creation to spring up with marvellous rapidity. Two months ago my garden appeared almost a desert, now it is a jungle; trees and shrubs growing

in the wildest confusion, almost impossible to keep in a show of order, whilst insects have appeared in proportion. It has always been a matter of wonder to me, and I have never seen it explained satisfactorily, that after an almost utter absence of insect-life, it should suddenly appear in myriads, without sufficient apparent reason. All through our past summer drought, I could find no moths; however I might hunt for them, they were practically absent, yet one month after the rains came, caterpillars of all kinds were swarming on every tree, bush, or shrub,—a most astonishing sight. Whether these will come to anything remains to be seen, being close to our winter, which is often very cold (I have seen the thermometer down to 18° on the grass); the probability is that most of them will perish in the pupa-state. I took a goodly number, and am anxiously watching to see if any imagoes will appear in the breeding cages before the cold sets in.—GEO. BARNARD, Coomooloolaroo, Duaringa, Queensland: *May 23rd, 1889.*

Occurrence in Worcestershire of Setodes punctata, F., a species of Trichoptera new to Britain.—Seeing that this insect is a native of France, Holland and Sweden, I have for years past thought that it should be findable in England. I am now able to announce its capture here. On the 19th July, when collecting on the Severn, in a secluded part of its northern course in this county, I swept from an ash tree on the river bank a specimen of the species. I have since devoted five days to working the river, north and south, within the county, but found no more. Strange to say, the only other Trichopteron which turned up was *Hydropsyche lepida*. The specimen has fared badly, having lost some of the pubescence and cilia of its front wings, few traces of the silvery dots remaining, and its hind abdomen being somewhat crushed.—J. E. FLETCHER, Worcester: *August 1st, 1889.*

[Mr. Fletcher sent the insect to me for confirmation of his determination, which I think is correct; but it is unfortunate that the specimen is in indifferent condition. I should like to see further examples.—R. McLACHLAN.]

Æschna borealis, Zett., at Rannoch.—In the May number, Mr. McLachlan contributed an interesting article on *Æschna borealis, Zett.*, a rare dragonfly of boreal and Alpine occurrence. The doubt implied therein as to whether the species still survived in its old Scotch haunts, suggested the idea of an excursion to Rannoch; and we accordingly spent the week ending 22nd June there in search of *Neuroptera* and *Trichoptera*. In the meantime we reserve any reference to the large and interesting collections made, with the exception that we think it right to record at once that five specimens of *Æschna borealis* (2 ♂, 3 ♀) were taken. These were mostly found (and others were seen) in or near the Black Wood, where they frequented the roadsides and open swampy places. But they were not confined to that quarter: one was caught on the opposite side of the Loch, and the species is thus probably distributed over the whole district.—KENNETH J. MORTON and J. J. F. X. KING, Glasgow: *July 10th, 1889.*

Heptaulacus villosus, Gyll., near Lewes.—The report of the capture of this species by Mr. J. J. Walker, R.N. (Ent. Mo. Mag., xxv, p. 359) reminds me that on June 8th, 1883, when collecting on the Downs close to this town with my friend Mr. C. H. Morris, we came upon this insect in some considerable numbers in one

small valley. They were to be taken both by sweeping and on the wing. Unfortunately at the time we did not know the rarity of the species, and secured but few specimens. Only one or two examples have occurred at the locality since. The conclusion we came to at the time was that it was attached to sheep dung.—J. H. A. JENNER, 4, East Street, Lewes: *August 3rd*, 1889.

Obituary.

Frederick Bond, F.Z.S., F.E.S., died on August 10th, in his 79th year, after an illness of some weeks' duration. He was the son of a military officer and was intended for the medical profession; he studied in connection therewith, but it was distasteful to him, and having a small independent income devoted his life to more congenial pursuits.

By the death of Mr. Bond we have lost one of our most observant and esteemed field-naturalists: a sportsman and naturalist combined. It might be difficult to say which of the two, in his earlier years, was dominant. The love of sport was evident, but so closely was it connected with observation, that we may almost take for granted the naturalist was superior to the sportsman in his character. This was especially marked in his ornithological pursuits, and is demonstrated by his frequent notes on rare British birds and their habits, published in the Natural History journals of the last half century, and their quotation in the most important works on British Ornithology. In Entomology, much the same spirit was manifested. While he was able, he was a most assiduous and observant collector of British *Lepidoptera*, and his collection, amassed from his own exertions, and from other sources, is probably the most extensive and representative now in existence, because it combines the past with the present, for, until very recently, he seized every opportunity of adding to it, and keeping it *au courant*. Mr. Bond was essentially of the old type of the British Naturalist. For anything from outside our islands he cared little. And, as has been the case with many others of the same class, much of the knowledge he possessed and stored up dies with him. Not being of a literary turn of mind, he published nothing more than small notes, both in Ornithology and Entomology: on the other hand, no one was more willing to impart his knowledge verbally, or by letter, to his many friends and correspondents. He was more ready with net and gun than with pen and books. His death leaves a distinct blank in another way: until recent years, when increasing deafness rendered conversation difficult, he was noted for his fund of anecdote and quaint humour, and always by his genial countenance, upon which time seemed to make little impression. Mr. Bond was unmarried, and for many years shared his house with a widowed half-sister (who survives him) and her family, and it was probably in connection with this that for a time he resided at Cambridge. His earlier notes date from Kingsbury, in Middlesex, then from St. John's Wood; subsequently he settled at Staines, where he died. He was one of the oldest Members of the Entomological Society of London, having been elected in 1841, and we think that on the existing list there remain only five who can claim priority. He joined the Zoological Society in 1854. His name is appropriately connected with *Tapinostola Bondii*, Knaggs, which remains best known as a British insect. A thorough Naturalist and genial friend has passed from amongst us.

Reviews.

REPORT OF THE ENTOMOLOGIST, CHARLES V. RILEY, M.A., Ph.D., FOR THE YEAR 1888. Containing Reports from Assistants and Agents of the Division (Author's Edition). From the Annual Report of the Department of Agriculture for the year 1888. Washington: Government Printing Office, 1889: pp. 53—144, 12 plates.

Like its many annual predecessors, this Report contains very much of paramount practical importance to agriculturists and horticulturists, and also of great interest to entomologists. Indeed, it is quite evident therefrom, that all remedial measures against men's insect foes that are not founded on comprehensive and particular knowledge of the species of insects and their natural history, are empirical, and more or less abortive. Several subjects are treated.

The Plum Curculio (*Conotrachelus nenuphar*, Herbst.) is fortunately not known to us, although it is very destructive in America.

The Fluted Scale (*Icerya Purchasi*), we are glad to learn, has received a check to its ravages, from several causes, in New Zealand and Australia, as well as in California; with reference to the influence of parasitic and predaceous insects introduced from Australia into the latter country, it is said, "That Nature will, with the conditions induced by these importations, come to the relief of the fruit grower, and that this interesting experiment will result in the ultimate saving of untold millions to the people of the Pacific coast is our sincere belief, which we hope to live to see verified." Incidentally it is mentioned that *Icerya sacchari*, Sign., from Mauritius, has been found to be synonymous with *Dortheesia seychellarum*, Westw., and quite distinct from *I. Purchasi*.

The experiences of the author in England, and his assistants in America, have clearly proved that the destructive Hop Aphid (*Phorodon humuli*) migrates from the hop to the wild or cultivated plum (where the eggs are laid and hibernated), and back again to the hop, as first stated by Francis Walker, in 1848, and that from the eggs of the migrated mother all the subsequent generations arise, thus confirming Lichtenstein's discovery of "stem-mother," "migrant," and "pupivora" forms. Founded upon this knowledge, simple and inexpensive remedies are recommended, from which, if carefully adopted, comparative exemption from the Aphids it is stated may confidently be expected. Thus, this matter becomes of international economic interest and importance.

There is also an article on Silk-culture, and numerous notes on remedies of various kinds for insect injuries.

The plates contain excellent figures of all the insects referred to, diagrams of apparatus used for destroying insects, and other subjects noticed.

We regret that our very limited space permits no more than this indication of the scope and purport of this valuable Report, from the study of which, all cultivators of fruits, trees, and plants, as well as entomologists, would derive advantage.

THE BUTTERFLIES OF NORTH AMERICA: by W. H. EDWARDS. Series iii, pt. viii. Boston: Houghton, Mifflin, & Co.; London: Trübner & Co. 1889.

We are sorry that space does not permit us to give copious extracts from this Part. It is occupied by *Papilio Pilumnus*, Bois. (an ally of *P. Daunus*, but with three tails). Especially interesting are the experiences related of the mode of

capture of this species by means of a *decoy*, either natural (a dry specimen) or artificial. *Argynnis Cybele*, F., var. *Carpenteri*, Edw., occupies considerable space, and there is much information on retardation and variation induced by cold. The author says:—"Evidently freezing served as a tonic; since 1880, I have been in the habit of freezing hibernating larvæ of all species, and have been very successful." The rest of the part concerns *Grapta interrogationis*, F., and *G. comma*, Harris, which are treated on in a very detailed manner.

BIRMINGHAM ENTOMOLOGICAL SOCIETY: *June 17th*, 1889.—Mr. H. TUNALEY, Vice-President, in the Chair.

Mr. Tunaley mentioned that he had bred *Lobophora viretata* from privet. Mr. R. C. Bradley showed a bred series of *Nepticula aurella*. Mr. E. C. Tye read a list of 13 species of butterflies and 18 of moths, taken in two fields in one hour at Marston Green. Mr. C. J. Wainwright showed a bred series of *Hemerophila abruptaria*. Mr. A. H. Martineau exhibited drawings of *Cecidomyia destructor* and some of its parasites.

July 1st, 1889.—Mr. W. BLATCH, President, in the Chair.

Mr. E. C. Tye showed larvæ of *Calocampa exoleta* from Marston Green. Mr. Neville Chamberlain exhibited *Amphydasis betularia*, var. *Doubledayaria*, and a dark *Oporabia dilutata*. Mr. C. J. Wainwright showed *Bryophila muralis*. Mr. R. C. Bradley, *Dasycera Oliviella* and *Ennychia octomaculata*, &c., from Wyre Forest. Mr. H. M. Lee exhibited *Catocala fraxini*, taken at Sutton in Surrey. Messrs. Perry and Hodgkinson exhibited *Coleoptera*.

July 15th, 1889.—The President in the Chair.

Mr. P. W. Abbott, of Sutton, was elected a Member.

Mr. Neville Chamberlain exhibited larvæ of *Papilio Machaon* and *Simyra venosa* from Wicken Fen. Mr. W. G. Blatch exhibited 244 species of *Coleoptera*, taken from one small mossy bank at Knowle. Rev. Charles F. Thorne will read a paper on the genus *Lobophora*, throwing new light on the life-history of *L. viretata*; discussion followed, in which Messrs. Tunaley and Blatch spoke. Mr. Tunaley remarked that he had successfully removed moths from pupæ, also that he had succeeded in causing moths which had remained undeveloped for several days, to complete their transformation by damping. Mr. Blatch said that his experience was similar.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, *June 27th*, 1889.—T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Mr. Joy exhibited *Bankia argentula*, Hb. Mr. Wellman, *Penthina pruniana*, Hb., var. *pullana*, Wd. Mr. R. Adkin, *Lobophora halterata*, Hufn., bred from larvæ taken in West Yorkshire. Mr. Tugwell said this species was not by any means uncommon in the southern counties. Mr. Strong, *Scodiona belgiana*, Hb., and a variety of *Bupalus piniaria*, L., from the New Forest. Mr. Dennis, a variety of *Argynnis Selene*, Schiff., from Ashdown. Mr. Waller, a fawn coloured variety of *Argynnis Euphrosyne*, L. Mr. Billups, specimens of *Eulophus damicornis*, Kirby, bred from pupæ attached to the leaves of lime trees from Oxshott, Surrey; a specimen of *Sehirus dubius*, Scop., taken by Mr. Carrington at Horsley; a series of

Corymbites quercus, var. *ochropterus*, Steph., taken at Armagh by the Rev. W. F. Johnson; also galls on *Lamium purpureum*, L., and *Torymus abdominalis*, Boh., the parasite bred from the same.

July 11th, 1889.—The President in the Chair.

Mr. Weir exhibited a specimen of *Pararge Egeria*, L., taken by Dr. Percy Rendall at Puerto Ventura, one of the Canaries; it was apparently the variety *Xiphia*, Fab. Mr. West, of Streatham, specimens of *Cidaria dotata*, L., with dark banded var., taken in his own garden. Mr. J. A. Clark, specimens of *Retinia resinella*, L., and Mr. Tugwell made remarks upon its curious habit of feeding and making its cocoon in resinous matter. Mr. Turner, a remarkable albino decoloration of *Melanippe fluctuata*, L. Mr. Adkin, *Spilosoma mendica*, Clerck, var. *rustica*, Hb., bred from selected parents; the offspring largely following their parents. Mr. N. E. Warne, *Cænonympha Davus*, Fb., from Cumberland; it was remarked that, like most English specimens, it differed on the under-side from the unicolorous Scotch forms. Mr. Weir, leaves of *Urtica dioica*, L., with a number of dead flies attached, surrounded by a fungus. Mr. Billups, clusters of *Anthrax ibis*, L., with parasites of the genus *Encyrtus*; *Orgilus obscurator*, Ns., bred from larvæ feeding on sawfly; also *Apanteles ruficrus*, Hal., in cocoon with remains of its host, *Diloba cæruleocephala*, L. Mr. Tugwell exhibited stems of *Salix repens*, L., with what appeared to be galls closely resembling in appearance the berries of *Vaccinium*.

July 25th, 1889.—The President in the Chair.

Mr. R. South exhibited a fawn-coloured variety of *Argynnis Adippe*, L.; also two varieties of *Argynnis Euphrosyne*, L. Mr. West, *Apamea ophiogramma*, Esp., taken in his garden at Streatham. Mr. R. Adkin, examples of *Selenia lunaria*, Schiff., *Amphidasys betularia*, L., *Odontopera bidentata*, Clerck., and *Bupalus piniaria*, L., bred from larvæ or pupæ received from Forres. Mr. Frohawk, living larvæ of *Nemeobius Lucina*, L. Mr. Wellman, bred series of *Sesia tipuliformis*, Clerck., *S. myopiformis*, Bork., *S. formiciformis*, Esp., and *S. musciformis*, Lasp., the last from Isle of Man. Mr. Auld, three specimens of *Callimorpha Hera*, L., var. *lutescens*, Staud., bred from ova of the same variety, taken in Devon, 1888. Mr. T. R. Billups, six out of the seven species of social wasps indigenous to this country, and read notes thereon. Remarks were made by several members on the failure this season of sugar to attract moths, and a discussion as to the cause of this ensued.

August 8th, 1889.—The President in the Chair.

Mr. Dawson exhibited a specimen of *Deilephila livornica*, Esp., taken near Plymouth in 1888; a melanic form of *Teniocampa incerta*, Hufn., taken at Plumstead; two varieties of *Polyommatus Phlæas*, L., taken at Plumstead. Mr. Dennis showed forms of *Bryophila perla*, H., including yellow specimens, and one having the superior wings almost suffused with black. Mr. R. Adkin, a specimen of *Chærocampa porcellus*, L., bred from a larva found last year, and which was put into a box without any earth, and had spun a cocoon some way from the bottom of the box, within which it pupated. Mr. Joy, a variety of *Epinephele hyperanthus*, L., having the spots on the under-side unusually large. Mr. Billups, a female of *Bracon Robertii*, Wesm., taken in his garden at Peckham; also series of *Ascogaster varipes*, Wesm. (both sexes), and *A. instabilis*, Wesm., and read notes; also galls on *Salix herbacea*, and their maker, *Nematus herbaceæ*, Cam., from Aberdeen. A communication was read from Mr. Cockerell, on "Bees and Poppy-flowers."—H. W. BARKER, Hon. Sec.

ENTOMOLOGICAL SOCIETY OF LONDON: *Aug. 7th*, 1889.—The Right Hon. LORD WALSLINGHAM, M.A., F.R.S., President, in the Chair.

The Rev. John Walley, of Wuhu, China, was elected a Fellow; and Professor Charles V. Riley, of Washington, United States, was elected an Honorary Fellow in place of the late Dr. Signoret, of Paris.

Mr. Walter F. Blandford exhibited a specimen of *Cardiophorus cinereus*, Herbst, taken at Tenby, and remarked that the species had rarely, if ever, previously been found in the United Kingdom. Mr. C. O. Waterhouse said he believed that there was a specimen in the collection of his late father, and also another specimen in the collection of the British Museum.

Mr. Waterhouse stated that the British Museum had just received from the Rev. Arthur Elwin, of Hangchow, China, a luminous larva about $1\frac{1}{2}$ in. long and $3\frac{1}{2}$ lines broad, which he believed to be one of the *Lampyridæ*.

Lord Walsingham exhibited specimens of *Conchylis Degreyana*, McLach., bred from seed-heads of *Plantago lanceolata* at Merton, Norfolk; also a specimen of *Tineidæ* allied to the genus *Solenobia*, probably belonging to *Dissoctena*, Staud., but differing somewhat in the structure of the antennæ. Lord Walsingham remarked that the specimen was taken by himself at Merton, on the 31st July last, and that the species was apparently undescribed.

Mr. Meyer-Darcis exhibited a collection of *Coleoptera*, comprising specimens of a species of *Loethrus* from Turkestan; *Julodis globithorax*, Stev., from the Caucasus; a new species of *Julodis* from Kurdistan; *Cardiaspis Mouhotii*, Saunders, from Sikkim; *Carabus smaragdinus*, Fisch., from Siberia; *Julodis ampliata*, Mars., from Aintab, Asia Minor, and a variety of the same from Kurdistan; and *Julodis luteogramma*, Mars., from Syria, and a variety of the same from Kurdistan.

Mr. H. Goss read extracts from letters from Mr. R. W. Fereday, of New Zealand, and Sir John Hall, K.C.M.G., relating to a number of *Lepidoptera* recently collected at sea, about half way between the River Plate and Rio, at a distance of over 250 miles from land, in about 30° S. lat. and 46° W. longitude. It was stated that the ship was surrounded by swarms of moths. Mr. J. J. Walker, R.N., observed that he had seen a large number of insects at sea about 150 miles off the coast of Brazil, and he referred to other records of the capture of insects at sea in Darwin's "Voyage of the Beagle," and Dr. Carpenter's "Cruise of the Alert." The discussion was continued by Dr. Sharp, Lord Walsingham, Mr. White, Mr. Kirby, and others.

Mr. E. Meyrick read a paper entitled "On some *Lepidoptera* from New Guinea," and exhibited the species described in the paper. He stated that the specimens were derived from two sources, viz., (1), a portion of the collection received by the Society from Baron Ferdinand von Müller, F.R.S., and collected by Mr. Sayer when accompanying the Australian Geographical Society's Exploring Expedition; and (2), a number of specimens collected by Mr. Kowald near Port Moresby, and obtained from him by Lord Walsingham.

Mr. Blandford read a letter from Mr. Wroughton, of Poona, asking for assistance in working out certain Indian *Hymenoptera* and *Diptera* in the collections of the Bombay Natural History Society. Lord Walsingham, Colonel Swinhoe, and Mr. Moore made some remarks on the subject.—H. Goss, *Hon. Secretary*.

THREE DAYS AT FERROL.

BY J. J. WALKER, R.N., F.E.S.

H. M. S. "Grappler," homeward bound from Gibraltar, encountered on April 14th, when off Cape Finisterre, a stiff gale from the north-east; and as it was somewhat doubtful whether the supply of coal on board was sufficient to carry the ship across the Bay of Biscay, it was decided, much to the satisfaction of all on board, and especially to my own, to run into Ferrol, then about 80 miles distant, and re-fill our bunkers. The weather was very thick, and the sea most unpleasantly rough, and it was with no small relief that we sighted the heights above Cape Prioriño about 4 p.m., and, soon afterwards, ran into smooth water at the entrance of the noble harbour of Ferrol.

It needs but a single glance at the land to recognise its granitic character, the scenery, at first sight, reminding one of some parts of the coast of Cornwall, though much bolder and more elevated, the slopes on either side of the harbour rising steeply to the height of 700 or 800 feet. These slopes are for the most part clothed with furze, at the time one mass of golden bloom, with scraggy thickets of oak, and plantations of stone-pines here and there, interspersed with strips of cultivated land, the vivid green of the young corn contrasting beautifully with the more sombre tints of the rough vegetation. The town of Ferrol stands on a low and somewhat square-shaped peninsula, situated about five miles up the harbour, between Jubia Bay on the south-east, and the smaller cove of Serantes on the north-west. The Royal Dockyard, with its extensive basins, &c., lies on the south-east side of this peninsula, and a high wall, built of granite and loopholed for musketry, entirely surrounds the town, with only two gates on the landward side.

It was too late to land on the evening of the 14th, and the next day was wretchedly cold and wet, but I had to go on shore on business in the forenoon, and again at 2 p.m.; when this was despatched, I thought that, as our stay here was very uncertain in its duration (depending upon the length of time that the weather remained unfavourable), I would try and see a little of the country, so I sallied out of the Jubia Gate under mackintosh and umbrella. The first thing which strikes one on landing is the fine physique and frank open bearing of the inhabitants, who, as a race, seem to me far superior to the Andalusian Spaniards whom I had just left. As for the town, there is not very much to note, though it is fairly clean and prosperous looking (although not entirely free from evil smells near the water's edge), and there are some fine old houses in the main street, which is

wide and straight, and like all the other streets in the town, paved with large blocks of granite. The population of Ferrol is about 20,000, mostly depending on the Royal Dockyard, one of the largest in Spain.

Leaving the Jubia Gate, I went some two miles along a very fine road, wide and perfectly straight, with a row of white poplars on either side. This road ran through fields of potatoes, colewort (run to seed), and young wheat, interspersed with little weedy patches, and divided by old stone walls, which looked not unpromising for *Coleoptera*. It was no day, however, for insects (though just the one for land-shells, *Pupæ*, *Bulimi*, *Clausiliæ* and *Helices*, all revelling in the abundant moisture), but I managed to find a few beetles by searching, chiefly under stones on the tops of the walls. The best of these was a most beautiful *Carabus (lateralis, Chev.)*, superficially somewhat like an enormous *C. nitens*, which I found among some old ivy in company with *Pæcilus cupreus*; I also met with a fine *Licinus* (near *depressus*), several *Harpali*, *Ocypus brunnipes*, various *Quedii* and *Philonthi*, and odd specimens of the genera *Baris*, *Rhytideres*, and *Sphenophorus*. An examination of the loose flakes of bark on some large *Eucalyptus* trees by the roadside produced *Throscus dermestoides* along with *Crioceris asparagi*, *Phædons*, and other common beetles. As I advanced, the country became somewhat wilder in character, and some nice little boggy patches, studded with good-sized alder trees, and bearing a good growth of primroses, *Cardamine pratensis*, and other familiar English flowers which I had not seen for some years, looked as though they would repay examination, but were much too wet to work at present. Next came some pine plantations, with a good undergrowth of heather, &c., where I wandered for some little time, picking up, among other things, one *Carabus melancholicus*, F., which I was rather surprised to see so far north. The rain continued, so I gave up collecting early, and returned on board in a very damp condition.

The morning of the 16th was cold and showery, but the weather improved a little at noon, and I landed, at 1.45 p.m., at the village of La Graña on the north side of the harbour. After turning over a stone or two near the beach, with no better result than a pair of *Choleva angustata*, I went along a steep, narrow, stone-walled lane leading up the hillside, and into a pine plantation. Here I got a few beetles, &c., such as a fine *Timarcha* with coral-red femora (on *Galium*), *Cneorhinus ludificator*, *Platyderus sp.*, a fine *Lygæus*, &c.; there was a great deal of moss, very damp and apparently suitable for working, but I could find in it only *Barypeithes brunnipes* and an *Orthochætes*, apparently our *O. setiger*. Ants abounded under almost every stone,

but *Drusilla canaliculata* was the only beetle with them. Some interesting little land-shells were found, chiefly by lifting the top stones of the walls, and I was somewhat startled to come across a huge salamander, coal-black, with large sharply-defined patches of the most brilliant chrome-yellow on the under-parts of the body, a most striking-looking beast. Leaving the pine plantation, I proceeded up a steep slope covered with an exceedingly interesting vegetation, consisting chiefly of two or three kinds of heath, the Cornish species, *Erica vagans*, being abundant. The beautiful Connemara heath, *Dabeocia polifolia*, was also plentiful in places, though very seldom to be found in flower at present. *Viola canina*, two or three species of *Narcissus*, a bright blue Boraginaceous flower, like *Lycopsis*, but of much stouter growth, *Polygala*, *Tormentilla*, and other pretty flowers abounded, while an occasional tuft of *Asphodelus racemosus* reminded one of more southern regions. Both the British species of *Ulex* (*nanus* and *europæus*) were of very fine growth, the latter attaining a height of twelve feet with a stem as thick as one's arm. Towards the top of these heights, at an elevation of some 700 feet, the vegetation got rather dwarfed and scanty, assuming somewhat the character of that of a Cornish moor, the "dry stone" walls also serving to recall the memory of that county. Turning over the granite stones, which were exceedingly numerous, yielded but few beetles; one fine *Heliopathes* was found, with a few ordinary forms of *Carabidæ* (*Platyderus*, &c.), also *Leistotrophus murinus* and *Onthophilus striatus*, in dry cow-dung. The wind was very cold and strong up here, so I soon descended into the more cultivated land near the harbour, through some picturesque but very muddy lanes between the occasional pine plantations. A very pretty little shining *Crypticus* occurred to the number of five under one stone, and I also found two more *Carabus lateralis*, one *C. melancholicus*, *Leistus fulvibarbis* and *rufescens* (I think), *Cionus blattariæ* beaten off *Scrophularia*, and a single specimen of a very beautiful shining scarlet and black *Lithonoma*. My way back led round the head of the Serantes creek, and into one of the gates of Ferrol, which I reached at about 6 p.m., having had a very pleasant and interesting, if somewhat damp, walk.

On the 17th, the weather had improved greatly, and the sun shone out at frequent intervals, but it still blew hard from the north-east, and was somewhat cold in the shade. I landed at Ferrol at 12.30, and went out round the head of the Serantes creek, finding *Carabus lateralis* before I got out of the town. This fine insect appears to be by no means rare here, as I obtained six specimens during the afternoon,

and might, no doubt, have got more, but for stupidly imagining that it was only *C. auratus*, and thus not working for it as I ought to have done. There were a good many bees and other *Hymenoptera* on the roadside flowers, and burrowing into the soft plaster walls of the houses; I also found another example of the beautiful *Lithonoma* taken yesterday, and several other useful beetles. Coming to a pine plantation, with a beautiful growth of heather, &c., under the trees, I saw a *Cicindela* flying about not rarely in a small sand pit at its edge, but on catching one it proved to be only our common *C. campestris*. Here, too, was the only place where I saw any butterflies all the afternoon: *Pieris brassicæ* and *napi*, *Pararge ægeria* (dark type-form) and *Megæra*, were flitting about not uncommonly, with occasional hibernated specimens of *Vanessa Io*; *Fidonia atomaria* was also observed, as well as the half-grown larvæ of *Chelonia cava* and *Bombyx quercus*, while *Grapholitha ulicetana* abounded among the furze bushes as at home. In a felled pine I found a good many examples of the conspicuous *Tomicus stenographus*, Dufts., and again tried the moss, with the result of one *Trachyphlæus*. I went to the top of the nearest hill, and walked on until I got a view of the coast outside the harbour, whither I had intended going, but time did not admit of doing so. There were few insects up here, but I got one example of a very nice species of *Asida*, two of a fine *Tarus*, a *Helops* not unlike *H. striatus*, and a fair supply of the *Timarcha* taken on the 15th. Going back through another pine plantation, I found a single very fresh *Lycæna Baton* ♂, at rest on the heather; *Hylobius abietis* was obtained by shaking cut pine branches over paper; and *Staphylinus cæsareus* occurred several times in the paths, one being taken in the act of eating a dead worm. The afternoon was finished up in the cultivated ground next the harbour, numbers of *Harpali*, of four species, occurring under small stones at the edges of the fields, *Clytus arcuatus* under chestnut bark, *Cetonia hirtella* on cabbage blossom, and, almost my last capture, *Dianöus cærulescens* off a stone in a little stream. Returning to Ferrol at 6.30 p.m., I went on board the ship soon afterwards, and at 5 a.m. the next day the "Grappler" sailed for Devonport.

It will be seen that nothing very rare or special was taken by me during this flying visit to Ferrol, and my three afternoon's work produced only 95 species of *Coleoptera*; but I feel sure that, with fine weather, I should at least have trebled this number in the same time, and I have no doubt that the locality would well repay any entomologist who could work there under more favourable conditions than fell to my lot.

SECOND SUPPLEMENT TO ANNOTATED LIST OF BRITISH
ANTHOMYIIDÆ.

BY R. H. MEADE.

This Family of *Diptera* contains so many species, and so many that are closely allied to each other, that I shall offer no apology for publishing some further remarks upon it. Since the date of my last supplement* several additional British species have been found, some of which seem new to science, while others are new to Great Britain; all of these I shall be glad to record, describing those that are new, and shortly pointing out those characters belonging to others by which they may be distinguished from their congeners, or which seem to be of interest.

The *Anthomyiidæ* have lately received a good deal of attention from continental Dipterists, especially from Dr. John Schnabl, of Warsaw, who has published several very valuable papers upon them.† He kindly sent me several rare and doubtful species, which will enable me to clear up some difficult and disputed points of synonymy.

Dr. Schnabl commenced his first paper by some remarks or criticisms upon the generic groups into which this Family has been subdivided, stating that he considered the genera *Hyetodesia*, *Mydæa*, *Spilogaster*, *Limnophora*, and *Trichophticus* to be separated from each other by insufficient and very artificial characters; he would, therefore, retain them in a single genus, for which he would keep R. Desvoidy's old name of *Aricia*.

This would be really a retrograde movement, as Prof. Mik has pointed out;‡ for as it is necessary, for the sake of convenience, to cut up large groups of species into smaller ones, it is better to give these groups names than to sub-divide the *Anthomyiidæ* in the way Zetterstedt and Walker have done, and as Meigen did at first.

It is impossible to make any generic groups altogether natural, for Nature knows nothing of genera, being only cognizant of species or individuals; all that we can do is to arrange those species together which resemble each other by the greatest number of characters; and, after all, every genus will contain some aberrant species which might almost be as well placed in another genus.

The genus among those mentioned which is most anomalous and difficult to define, or separate from *Hyetodesia*, is *Trichophticus* of

* January, 1887.

† "Contributions à la Faune Diptérologique," par J. Schnabl. St. Petersburg: 1887, 1888, 1889.

‡ Entomologische Nachrichten, 1887, Heft. xv.

Rondani. If I were about to revise the generic arrangement of the *Anthomyiidae*, I should be tempted to expunge this genus and insert a new one in its place, next to *Hyetodesia* (*Aricia**), and include in it all those species with hairy eyes and toothless femora, which have a pubescent instead of a plumose arista, only moderate though unequal sized alulets, and an oblong or conical instead of an oval abdomen.

I shall arrange the observations which I have to make concerning different species under the respective genera to which they belong.

HYETODESIA, Mde.

H. VAGANS, Fln.

I inserted this fly in my list upon the authority of Walker, though I doubted whether it was a distinct species, as all the specimens I had seen so named were identical with *H. basalis*, Zett.; through the kindness of Dr. Schnabl, however, I have now obtained both male and female specimens of what seem to me to be the true *M. vagans* of Fallén, and they are quite distinct from *H. basalis*, Zett.

Fallén describes the two points which are characteristic of this species, when he says that the eyes are only pubescent and separated a little from each other in the male. His words are "oculi vix hirsutuli in mare approximati non coherentes." Zetterstedt points out the same peculiarities, but they have been overlooked by Meigen, Macquart, Schiner, and Walker. In distinction from this, *H. basalis* has the eyes of the male furnished with long hairs, and quite contiguous. There are also several other characters by which these two species may be known from each other, viz., *H. vagans* is rather larger than *H. basalis*; the colour is more ash-grey in the former, while it is yellow-grey in the latter; the face is rather more prominent and the cheeks deeper in *H. vagans* than in *H. basalis*; the palpi are much thicker in *H. vagans* than in *H. basalis*; the fore femora are more or less blackened in *H. vagans*, while they are usually quite pale in *H. basalis*; and lastly, the middle stripes upon the thorax are placed nearer together in the former than in the latter species. The female of *H. vagans* resembles the male in all the principal characters, the eyes are about as hairy as those of the male, while in *H. basalis*, though the males have the eyes long haired, those of the females are almost naked.

This species seems to be very rare, except in the north of Europe; I have not seen a British specimen.

H. VARIEGATA, Mgn.

I formerly looked upon this species as only a variety of *H. scutellaris*, Fln., but upon the examination of a specimen kindly sent to me by Dr. Schnabl, I find that there are several decided points of distinction between them. The male has the head wider and the eyes a little wider apart in *H. variegata* than in *H. scutellaris*; the antennæ are rather shorter in the former than in the latter and entirely black or grey, while the basal joints are usually rufous in *H. scutellaris*; in *H. variegata* the shoulders of the male are usually concolorous with the rest of the thorax, while they are more or less rufous or fulvous in *H. scutellaris*; in *H. variegata* the scu-

* If the above scheme was carried out, I should be inclined to re-introduce the name of *Aricia* instead of *Hyetodesia*, as I think it was changed by Rondani upon insufficient grounds.

tellum is nigrescent at the base, while in *H. scutellaris* it is wholly pale, as in *M. pagana*. The abdomen in *H. variegata* has always a decided black longitudinal stripe on the dorsum, which becomes widened posteriorly, giving it a strong resemblance to the abdomen of *Musca corvina*; in *H. scutellaris*, on the contrary, the dorsal stripe is either wanting or only short and narrow; the abdomen also has the edges of the segments often marked with transverse black lines, which are not found in *H. variegata*. The females of the two species are more difficult to distinguish from each other, as the shoulders of those of *H. variegata* are often rufous like those of *H. scutellaris*.

This species seems to be rare upon the continent; I have not seen a British example.

H. LUGUBRIS, Mgn.

Several distinct though very closely allied species have been mixed up under this name. Zetterstedt separated two from *H. lugubris*, which he named *H. morio* and *H. consobrina*, but his diagnostic points of distinction are not very clear, especially those separating *H. morio* from *H. lugubris*, which, from his description, would only appear to be varieties of the same species, as he seems to have suspected himself, for he says, "forte tamen specie diversæ." There is no doubt, however, that there are several quite distinct species allied to *H. lugubris*.

Some years ago I received a specimen of *Hyetodesia* from Herr Kowarz, captured at Asch, in Bohemia, which he labelled *H. lugubris*; this was the only fly bearing this name which I had then seen, and the remarks made in my list respecting this species (in the description of *H. dubia*) were taken from it. Having lately obtained other specimens named *H. lugubris* from Dr. Schnabl, of Warsaw, and Herr Kuntze, of Dresden, I find that they are quite distinct from Herr Kowarz's example, and upon sending the latter to Dr. Schnabl, he tells me that it is a new and undescribed species.

This group of species has been very carefully studied by Dr. Schnabl, and the several distinct ones which he has defined are most elaborately described. He makes *H. morio*, Zett., to be quite distinct from *H. lugubris*, Mgn., the eyes of the male being subcoherent in the former, while they are contiguous in the latter; the arista in *H. morio* is also shorter haired, and the epistome less prominent than in *H. lugubris*; besides which, the number of post-sutural central dorso-thoracic bristles is not the same, there being four in *H. morio* and only three in *H. lugubris*. Dr. Schnabl has also fully described *H. consobrina*, Zett., which he says has a still shorter epistome and shorter haired arista than *H. morio*. I do not know whether he has seen Zetterstedt's types, or named these decidedly distinct species after him upon his own authority. Dr. Schnabl has also described another and new species belonging to this group, which he has named *H. hybrida*.

To show the difficulty of defining the characters of the true *H. lugubris* of Meigen, I may mention that the specimens sent to me from Warsaw and Dresden, though exactly similar in most points, such as having the projecting snoutlike epistome, long haired arista, contiguous male eyes, black indistinctly striped thorax, &c., which are characteristic of the species, had a different number of post-sutural thoracic bristles, those from Warsaw having only three, while those from Dresden had four.

When I published my Annotated List and First Supplement, I had not seen a British specimen of *H. lugubris* or of any of its congeners, though it had been recorded as indigenous by Stephens and Walker. A few months since, however, I had the pleasure of receiving one from Miss R. Prescott-Decie, of Bockleton Court, near Tenbury, which she had captured at Chagford, South Devon, in May, 1888. I determined this to be *H. consobrina*, Zett.

H. SUDETICA, Schn.

At Baslow, in Derbyshire, in July, 1887, I captured two males of a distinct and well marked little species which appeared to me to be new to science. In colour, form and general appearance it bore a strong resemblance to *H. basalis*, Zett., but was only half the size; and also differed by having only a pubescent arista and short haired eyes. I was in doubt whether to place it in the genus *Hyetodesia* or *Trichophticus*, especially as it had a strong spur at the inner end of each hind tibia, as is found in several species of the latter genus; but the oval shape of the abdomen with its general form and colour pointed to its proper place being in the more highly developed genus. I intended to publish a description of it, but delayed doing so until I found that it had also been discovered at about the same time (in July and August, 1887) by my friend Dr. Schnabl at Gräfenberg, in Austrian Silesia, and a description of it published in the *Entomologische Nachrichten** under the name of *Alloeostylus sudeticus*. He placed it in a new genus, in which he also included *H. simplex*, Wdm., and *M. flaveola*, Fln., but I think it better to leave it for the present in the genus *Hyetodesia*.

This little fly is about 5 mm. ($2\frac{1}{2}$ lines) in length, of a yellowish-grey colour, with the thorax marked with four longitudinal black stripes, the outer ones being maculiform, and furnished with four post-sutural dorso-central bristles. The abdomen has a fine dorso-central stripe, and shows some dark reflections; the legs are testaceous with black tarsi, and in my specimens the fore femora only have the greater part nigrescent; while Schnabl says that in his, "femoribus obscure piceis," which I suppose applies to them all. The hind tibiæ, as I have mentioned, are armed at their inner extremities with a blunt spine or spur, which consists of two bristles joined together into a fasciculus. I have not seen a female, but Dr. Schnabl captured two which seem closely to resemble the males.

(To be continued).

Lygus viscicola, Puton, in England.—Yesterday I received from Dr. T. A. Chapman, of Hereford, specimens of *Lygus viscicola*, ♂, ♀, one of the two species of *Hemiptera* recently described by Dr. Puton, which I noted, at page 256 *ante*, as likely to occur in England. Dr. Chapman says that it is now common at Hereford on mistletoe only. They agree entirely with Dr. Puton's description briefly quoted, *l. c.* —J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: September 17th, 1889.

ON A NEW SPECIES OF *TERETRIOSOMA*, HORN.

BY G. LEWIS, F.L.S.

TERETRIOSOMA HORN, *n. sp.*

Cylindricum, viride, metallicum, undique sat dense punctatum, subtus minutissime strigoso-rugosum; antennis pedibusque obscure rufis; fronte parum convexa; pronoto stria integra; elytris transversim basi impressis; pygidio in medio leviter conigero, infra concavo; prosterno lato in medio haud striato, striis marginalibus validis, rectis, antice sensim divaricatis, lobo subtruncato; mesosterno antice marginato; tibiis anticis mediisque 6-dentatis.

Length, $2\frac{1}{2}$ mm.

This species in colour is like *T. virens*, Mars., and it resembles it also in structure, but it may be known from it by the following characters:—It is longer and narrower in proportion to its width; the transverse ridge of the pygidium, which divides the concave from the convex portion (easiest seen from beneath), shows a slight but distinct tendency to being conical in the middle; the prosternal lateral margins are more distinctly elevated, are straighter and diverge gradually to the edge of the lobe; the lobe is more truncate, and the meso- and meta-sternal plates (corresponding with the greater length of the whole insect) are very distinctly longer. The antennæ have the scape clothed with greyish hairs like *T. virens*, Mars., but the pubescence is not conspicuous as in *T. cyaneum*, Lewis. In *Teretriosoma virens* the outline of the ridge of the pygidium is semi-circular.

The generic character for *Teretriosoma* given by Horn, "prosternum without striæ," is a salient one, and will serve to distinguish all the species from *Teretrius*. *Teretriosoma* now contains twelve species; besides two in my collection yet uncharacterized, ten are from America, one, *facetum*, Lewis, from India and Ceylon, and one, *T. Somerseti*, Marseul, from Australia. Whether the boss on the pygidium is a sexual character or not is an open question, as I have only one example.

This interesting addition to the American Fauna is from Key West, Florida, and has been taken on a species of *Rhus*, which was doubtless infested with wood-boring beetles. Dr. Geo. H. Horn has kindly sent me an example with permission to describe it, and it is with a feeling of indebtedness for it and much general entomological information that I have named it after him.

Queen's Ride, Barnes:

August, 1889.

ON A SPECIES OF *AMBLYOPUS* (*EROTYLIDÆ*) FROM JAPAN.

BY G. LEWIS, F.L.S.

AMBLYOPUS PALMIPES, *n. sp.*

Oblongo-ovatus, parum convexus, nitidus; fronte thoraceque rufis; scutello rufo nigro-marginato; elytris nigris punctato-striatis; subtus testaceo-rufus, metasterno nigro; pedibus nigris apice triangulariter dilatatis.

Length, $5\frac{1}{2}$ —6 mm.

Oblong ovate, rather convex; head, thorax, mesosternum and abdomen red; metasternum black; antennæ pitchy-black. Head and thorax evenly and somewhat thickly punctured; epistoma infusate with two shallow impressions; scutellum red in middle, margined at sides with black; elytra punctate striate with interstices finely punctulate; the prosternum is bistriate, striæ very slightly sinuate at the coxæ, hooked at the tips, but they do not approach near to one another, base not margined; mesosternum red, transverse, striate at the sides, striæ bent inwards in front; the tibiæ are clothed with greyish hairs, and from the middle to the apex are conspicuously dilated, the dilation being triangular, especially in the intermediate pair.

I obtained four examples of this species at Chiuzenji, but its facies being so much like *Eutriplax* (Ann. Mag. Nat. His., 1887, p. 342) *tuberculifrons*, Lewis, the specimens were overlooked at the time. The *Eutriplax* may be known in the field at once by the four transverse black spots on the thorax. This is the fifty-first species in the Family recorded from Japan, thirteen of which have been first noticed in this Magazine.

Queen's Ride, Barnes:

August 31st, 1889.

Ectobia Panzeri, var. *nigripes*.—Mr. Shaw is mistaken (Ent. Mo. Mag., xxv, p. 369) in attributing the capture of this insect to myself. The specimens he alludes to were taken by Mr. James Eardley Mason, of Alford, when on a visit to Cornwall last year, and by him were given to me.—GEO. T. PORRITT, Huddersfield: September 13th, 1889.

Eupithecia extensaria near *Hunstanton*.—From August 9th to 30th this year I spent on the Norfolk coast at Hunstanton. For entomological investigations the weather was, most of the time, about as bad as could be; but even if we could have got out much, the locality would evidently have been very unproductive. Mr. G. C. Dennis, of York, was with me the first fortnight, and together we made careful but unsuccessful searches on different parts of the coast for the larva of *Eupithecia extensaria*. On the 27th, however, I was more fortunate, and on the morning of that date, I beat out nearly sixty larvæ from *Artemisia maritima*, varying in size from quite small to full growth; and on the 29th, a further quantity on the same ground. On the 28th, I tried an apparently similar ground on another part of the coast, where the *Artemisia* grew quite as luxuriantly, but could find no trace of it. The species occurs on the *Artemisia maritima* growing on the sides of the ditches on the salt-marshes, and not, so far as I could discover, on plants growing on the flat and more open ground.

Though I found the larva rather freely where it did occur, the moth is evidently very local, for I could only get the larvæ along, probably, 300 yards or so on one ditch, beyond which, on the same ditch, I could not beat out any, although the food was equally plentiful. Nor could I find it on any of the many other ditches on the same salt-marsh, I worked. Still, I have little doubt it occurs in other similar spots on the Norfolk coast, as there is so much of the food-plant, and

apparently suitable ground. But if it does not, it could, no doubt, as Mr. Barrett says (*Ent. Mo. Mag.*, xxv, p. 258), be easily exterminated in Britain. Mr. Barrett did not tell me his and Mr. Atmore's locality (see *Ent. Mo. Mag.*, xxv, p. 258), but I fancy mine is quite a distinct one from their's.

Very few other *Lepidoptera* of interest were taken. Some nice forms of *Agrotis cursoria* occurred on ragwort flowers; and *Agdistes Bennettii* was not uncommon among *Statice limonium* on the salt-marshes. A few nearly full-grown larvæ of *Agrotis ripæ* were found by scraping up the sand about the *Salsola kali* growing on the sand-hills.—ID.: *September 14th*, 1889.

Catocala fraxini and *C. sponsa* at *Winchelsea*.—I am glad to be able to record the occurrence of both these species in this neighbourhood. They were taken by Mr. Donald Carr, of Holbrook Hall, Derby, at sugar, on the Cliff at Winchelsea; *C. sponsa* on August 20th, *C. fraxini* on August 22nd. I have no previous record of the occurrence of either species in this district. Mr. Carr adds, "We took *C. sponsa* during a westerly gale which blew for about three days, and *C. fraxini* on a still night after the gale had subsided."—E. N. BLOOMFIELD, Guestling Rectory: *September 17th*, 1889.

Re-occurrence of Epischnia (Cateremna) terebrella near *Lynn*.—The experience gained last year proved of good service this spring when examining the multitudes of fallen spruce cones, and a larger number of infested cones was consequently secured. No external indications of "frass" were in any case seen—indeed, it is all packed away in the interior,—but the cone is often soft and easy to break, where the large chamber is situated, and the larva is thus readily seen. Some were rather small when found, and inhabited a space near the apex of an otherwise sound cone, but most were well grown, and one had so far changed to a dull yellowish-white, that I hoped I had found the other species which feeds in these cones—*Dioryctria splendidella*—but it proved otherwise. The hot weather in May pushed them forward very rapidly, and the first specimens emerged on the 25th of that month; others appeared at shorter or longer intervals during two months at least—one certainly emerged on July 25th.

The most curious circumstance about this species was its partiality to thunder storms. During my absence from home in the beginning of June, my son wrote to say that three had emerged, and that each had come out during a thunderstorm. Afterwards, I found this to be regularly the case: thunder storms were, this season, of very frequent occurrence, and nearly every specimen appeared while one of them was at its height, or during some heavy shower of rain, which indicated a storm elsewhere. I have never known any other species so influenced by electricity—except, perhaps, in the opposite direction,—a week of fairly fine weather might pass without the emergence of a specimen, even a slight storm or moderate shower would pass unnoticed, but as soon as crushing peals were heard overhead and torrents of rain came down, *terebrella*—indoors—would be seen running about under the gauze covering of a vessel containing the cones. I do not recollect such a habit in the species last year, and am inclined to think that the raised temperature usually occurring just before the storm may have had something to do with it in this cool summer.—CHAS. G. BARRETT, Norfolk Street, King's Lynn: *September 14th*, 1889.

Time of appearance of Chauliodus insecurellus.—There can be little doubt, I think, that this species is double-brooded in Britain, as mentioned by Mr. Warren (Ent. Mo. Mag., xxiv, p. 144). Mr. Meyrick's specimens were captured in June (Ent. Mo. Mag., ante, p. 361), and I took specimens myself on Freshwater Downs, Isle of Wight, during the first week of the present month (August).—J. W. TUTT, Westcombe Park, S.E.: August 22nd, 1889.

Crabro leucostoma, L.: its Nidification, and two Parasites.—In March, 1885, I fell in with a willow that had been split from top almost to bottom, the smaller portion of which was bent downward till its top almost touched the grass. In the exposed wood near the head of this part were a number of cocoons crowded together within a small space. A small piece, some three and half inches diameter, of this wood I took home, and bred therefrom in May and June twenty-seven specimens of *Crabro leucostoma*, one *Tryphon signator*, and one small Tachinid. The last I have just tried to obtain the name of, but without success.

Wishing to ascertain what connection, if any, existed between the *Crabro* and the other insects, I carefully picked to bits the wood, finding twenty-nine vacated cocoons, three containing dead pupæ, and three cells provisioned with a species of *Dolichopodidæ* (in colour resembling *Dolichopus atratus*, but smaller), dry and too brittle to disentangle, which had not been at all fed upon.

Twenty-seven of the vacated cocoons were roughly broken off at the head end, at about one-fourth of their length—corresponding in number with the *Crabros* bred; while two were perforated, one near the head end, the other at the opposite extremity. The latter cocoons were carded and preserved, and I have just cut them open with fine scissors: the result being that the one perforated at the tail end contained the exuvie of an Ichneumon, the *Tryphon*, the one perforated at the head end the very thin and collapsed puparium of the Tachinid.

I have several times bred species of *Tachinidæ*, and found that, whilst most species pupated in the earth, others pupated in the puparia, or even pupæ, of their victims.

Several of the *Crabro* cocoons were so close to the exposed surface of the wood, and the wood was so easily penetrable, that there could have been no extraordinary obstacle to oviposition by either parasite.—J. E. FLETCHER, Worcester: August, 1889.

Gnorimus variabilis, L., in Windsor Forest.—In my work on British *Coleoptera*, Part xxxi, p. 59, I stated, as I believed to be the fact, that *Gnorimus variabilis* had not occurred in the above locality for many years past; I have lately received the following communication from Mr. J. C. Bowring, of Forest Farm, Windsor Forest, which will probably be very interesting to many British Coleopterists, as showing that some of our rarer species are probably by no means extinct, but only overlooked:

"It may interest you to learn that many specimens have been taken here by myself and my boys during the last few years, and that last year no less than nine (two males and seven females) were found on one oak tree in our grounds. It is curious that among *all* the specimens taken during the last six years only two males have been captured.

"A fine specimen of *Gnorimus nobilis* was taken by one of my sons at Woolwich, under some lime trees, in June last.

"*Prionus coriarius* is rather plentiful here in some years. This month, five fine specimens have been taken on one oak on our lawn, all of which emerged from roots running along the ground, leaving holes like those of bees' nests; they were all captured in the evening.

"*Lymezylon navale* has also been captured, flying, on our lawn."—W. W. FOWLER, Lincoln: September 7th, 1889.

Coleoptera in Sherwood Forest.—On a visit to Sherwood Forest in the middle of June last, I captured the following among a large number of other *Coleoptera*: *Anisotoma dubia*, *Colenis dentipes*, *Scydmaenus Godarti*, *Scydmaenus* sp. ? (allied to *S. Sparshalli*, and about the same size; the whole body, and especially the legs and antennæ, lighter coloured. Pubescence longer. Thorax with the transverse basal line interrupted in the middle by a small fold with a minute fovea on each side of it. The basal foveæ in *S. Sparshalli* are closer together than in this species. Antennæ more distinctly clavate, and with the third joint longer than in *Sparshalli*. Apex of elytra more rounded. Taken under bark on birch stumps in May, 1884, September, 1885, and in June, 1889). *Eutheia clavata*, *Batrissus venustus*, *Euplectus nubigena*, *Bolitochara lucida* (in *Polyporus* on an old oak), *Leptusa ruficollis*, *Oxytoda umbrata*, *Homalota nigrifolia* (in *Polyporus*), *H. ignobilis*, *H. humeralis*, *H. cadaverina*, *H. muscorum* (in extreme abundance on sappy stumps of recently felled oaks), *H. pilosiventris* (sap), *H. macrocera* (sap), *H. celata* (sap), *Quedius lateralis*, *xanthopus*, and *scitus*, *Othius punctipennis*, *Stilicis rufipes*, *Ptenidium turgidum*, *Orthoperus atomus*, *Exochomus 4-pustulatus*, *Abræus granulum*, *Plegaderus dissectus*, *Micropeplus tesserula* (36 specimens taken off a sappy stump of recently felled oak), *Meligethes morosus*, *Rhizophagus nitidulus*, *R. perforatus*, *R.* — nov. sp. ?, *Monotoma longicollis*, *Corticaria serrata*, *Henoticus serratus* (under birch bark, taken by J. Kidson Taylor in the same locality, and under similar conditions, 20 years ago, and recorded in Ent. Mo. Mag., 1869; Canon Fowler omits this record from his work), *Atomaria elongatula* and *ruficornis*, *Tiresias serra*, *Aspidiphorus orbiculatus*, *Aphodius inquinatus*, *Athous rhombeus*, *Sphindus dubius*, *Callidium variabile*, *Saperda scalaris*, *Hypophlæus castaneus*, *Eryx ater*, *Apion marchicum*, *Rhyncolus cylindrirostris*, *Rhyncolus gracilis*, *Scolytus intricatus*, *Rhinoncus castor*.—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham: September 11th, 1889.

Hemiptera at Ewhurst.—The following were the chief results of some collecting in the neighbourhood of Ewhurst, Surrey, during August:—*Macrodema microptera*, two macropterous specimens, one at Conehurst Hill, and one at Leith Hill; *Rhy-parochromus antennatus* (2), amongst roots of grass and moss on a wayside bank; *Monanthia quadrimaculata*, several from old apple trees in an abandoned orchard; others were still in the larval condition at the end of the month; *Eroticoris rufescens* (3), amongst heath; *Macrocoleus solitarius* (2), by sweeping; *Amblytulus affinis*, at roots of grass; *Ploiaria vagabunda*, from apple trees and spruce firs; *Corizus capitatus* and *C. maculatus*, one each by sweeping. The latter was a nymph when captured, but as it appeared about full-grown, I kept it in hopes that it might soon change its skin; it was, however, ten days before the desired result took place, during which time it fasted with apparently no evil consequences, as it issued an imago perfect in every respect.

Amongst the *Homoptera*, the most noteworthy capture was that of *Platymeris undatus*. This fine species was first recorded as British in the year 1882, when Messrs. Scott and Bignell took it at Bickleigh; no other record of its capture has, I believe, been made, and it is interesting to note its present occurrence at a locality so far distant from its old quarters in Devonshire. I found it widely distributed, always on *Pteris*, but it nowhere occurred in more than single examples, except at one spot, an area of a few square yards of waste ground by a roadside, where I got some eight or nine specimens. *Thamnotettix cruentata* occurred abundantly with it on this same small area, but nowhere else.—E. A. BUTLER, Ashby Road, Crouch Hill, N.: September 12th, 1889.

Obituary.

Theodor Kirsch, "Custos" for Entomology in the Dresden Museum, died on July 8th. He published much on exotic *Coleoptera*, chiefly in the *Berliner entomologische Zeitschrift*. There is also a paper by him on the Butterflies of Timorlaut in the Proceedings of the Zoological Society for 1885.

Rev. H. J. Gore, M.A., died at Hampstead on September 3rd, aged 75. For many years he was Rector of Ruspur, near Horsham, Sussex. He had been a subscriber to this Magazine from its commencement, more than 25 years ago, and was an assiduous collector, chiefly of British *Coleoptera*, but published very little. A few years ago he retired from active clerical duties and settled near London.

Review.

CATALOGUE RAISONNÉ ET SYNONYMIQUE DES NÉVROPTÈRES, observés dans les PAYS BAS, et dans les pays limitrophes: par HERMAN ALBARDA. Martinus Nijhoff, La Haye: 1889.

Following close upon the List of Belgian *Neuroptera*, by De Selys-Longchamps (which we noticed in our issue of December, 1888), we have now before us the long-expected Catalogue for Holland, a bulky pamphlet occupying 168 pp. of the "Tijdschrift voor Entomologie" (Vol. xxxii).

It is needless to say that any List of this nature worked out by Albarda could be nothing if not exhaustive, and it is seldom we have had the pleasure of noticing such a careful compilation. The two Lists (Belgian and Dutch) are elaborated much on the same principle, the geographical district being continuous. The Belgian List noticed the species found in Holland; the Dutch List intercalates those found in Belgium, and also in the adjacent parts of Germany.

Albarda has, for more than twenty years, worked most assiduously at his subject, and has received the assistance of numerous coadjutors in various parts of the kingdom of Holland. The introductory portion consists of an analysis of the Dutch authors who have noticed their *Neuroptera*, commencing with Clutins in 1634, and a copious, general bibliography completes the work. The local details are full, and are worked out, in the first instance, according to the provinces in which any particular species has been observed; and, secondly, as to special localities and the names of the observers. It is not necessary here to enter into minute details as to the fauna and its peculiarities; on these points the notice given of the species that occur in the immediately adjacent political districts is instructive. For Holland itself about 312 species are enumerated, viz.: 30 *Psocidæ*, 20 *Perlidæ*, 41 *Ephemeridæ*, 52 *Odonata*, 55 *Planipennia*, and 114 *Trichoptera*.

The author says, with truth, "En tout pays les Névroptéristes sont clair semés," but it is with great gratification we regard the existing state of things with that of twenty-five years ago.

BIRMINGHAM ENTOMOLOGICAL SOCIETY: Aug. 19th, 1889.—Mr. W. G. BLATCH, President, in the Chair.

Mr. C. J. Wainwright showed *Sphinx convolvuli* taken in Handsworth, *S. ligustri* from Ely, &c. Mr. R. C. Bradley showed *Lithocolletis messaniella* from Moseley; also a small branch of oak, every leaf of which contained many mines of the species. Mr. P. W. Abbott showed *Triphana interjecta* from the Isle of Wight, and *T. fimbria* from Sutton.

September 2nd, 1889.—The President in the Chair.

Messrs. R. Freer, of Rugeley, and J. T. Harris, of Burton-on-Trent, were elected Members.

Mr. H. M. Lee showed *Calocampa solidaginis* from Cannock Chase, and Mr. Blatch showed it from Hopwas Wood, the latter being a new locality for the species. Mr. E. C. Tye showed young larvæ of *Acidalia emutaria*. Mr. R. C. Bradley showed varieties of *Abraxas grossulariata*. Mr. C. J. Wainwright showed *Xanthia cerago*, *silago*, and *ferruginea*, which he had bred in considerable numbers from catkins collected at Wyre Forest and Scounslo Green. Mr. H. Stone showed, under the microscope, *Empusa muscæ*.—COLBRAN J. WAINWRIGHT, Hon. Sec.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: August 22nd, 1889.—J. T. CARRINGTON, Esq., F.L.S., Vice-President, in the Chair.

Mr. Wellman exhibited a number of *Abraxas grossulariata*, L., showing considerable variation, and *Scoparia angustea*, St., from Folkestone. Mr. Skinner, a bleached example of *Epinephle Janira*, L., taken at Box Hill. Mr. Carrington, on behalf of Mr. G. A. Lewcock, some 300 specimens of *Coleoptera* taken during the season, mainly from Chattenden, Epping, Woking and Farnham.

September 8th, 1889.—T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Mr. J. Jenner Weir exhibited desquamated upper-wings of the male of *Argynnis Paphia*, L., in order to show that the apparent thickening of the median nervules and sub-median nervure, in that sex of the species, was due to the dense covering of broad scales, bent over and concealing some very narrow clavate black scales or androconia, that appeared to be of a different substance to the ordinary scales. Mr. Weir remarked that some British Entomologists appeared to think that in the restricted genus *Argynnis* there was a real dilatation of some of the median nervules, and occasionally of the sub-median nervure, but neither American nor German Entomologists had fallen into such an error. Mr. Weir also exhibited specimens of *Vanessa urticae*, L., bred from larvæ taken at Lewes, showing great variation in the amount of yellow in the fore-wings. Mr. Wellman, *Bryophila muralis*, Forst., *Lobophora polycommata*, Hb., and dark forms of *Gnophos obscuraria*, Hb., from Folkestone. Mr. Croker, *Gnophos obscuraria*, from the New Forest, and a variety of *Taniocampa gothica*, L., closely approaching *gothicina*, H.-S., taken at West Wickham. Mr. Fenn mentioned that he had taken a similar variety at Lewisham. Mr. Auld, a long series of *Cidaria truncata*, Hufn., bred from eggs

obtained from a female taken in the New Forest. Mr. Dennis, varieties of *Lycana Corydon*, Fb., and *Polyommatus Phlæas*, L. Mr. Turner, a variety of *Hypsipetes sordidata*, Fb., also dark forms of *Boarmia gemmaria*, Brahm., from Ashdown Forest, and specimens of *Cabera rotundaria*, Haw. A discussion ensued as to whether this was a distinct species or only a variety of *C. pusaria*, L. Mr. Carrington mentioned that several specimens of *Catocala fraxini*, L., had been recently taken.—H. W. BARKER, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON: *Sept. 4th*, 1889.—H. J. ELWES, Esq., F.L.S., Vice-President, in the Chair.

Prof. C. H. Fernald, of Amherst, Mass., U.S.A., and Mr. C. J. Fryer, of Emscote Road, Warwick, were elected Fellows.

Mr. George T. Baker exhibited two remarkably dark specimens of *Acronycta ligustri* taken near Llangollen.

Mr. P. B. Mason exhibited and remarked on a collection of *Lepidoptera* which he had recently made in Iceland. The following species, amongst others, were represented, viz.:—*Crymodes exulis*, *Triphæna pronuba*, *Noctua conflua*, *Plusia gamma*, *Larentia cæsiata*, *Melanippe sociata*, *Coremia munitata*, *Phycis fusca*, and *Crambus pascuellus*.

The Rev. Dr. Walker also exhibited a number of *Lepidoptera*, *Diptera*, and *Hymenoptera*, recently collected by himself in Iceland. The collection included the following, viz.:—*Crymodes exulis*, *Noctua conflua*, *Larentia cæsiata*, *Coremia munitata*, *Culex pipiens*, *Scatophaga stercoraria*, *Calliphora erythrocephala*, *Helophilus grænlandica*, *Bombus terrestris*, &c.

Mr. W. White exhibited, on behalf of Mr. G. C. Griffiths, a specimen of *Nephronia Hippiæ*, Fab., var. *gæa*, Feld., which he believed to be hermaphrodite. He also exhibited, for comparison, a female of the same species. A discussion on hermaphroditism ensued, in which Mr. Distant, Mr. Elwes, Mr. McLachlan, and Mr. Baker took part.

Dr. Sharp exhibited specimens of *Cychramus luteus* and *fungicola*, auct., and stated that they are the sexes of one species, *C. luteus* being the male, *C. fungicola* the female. In working through the Central American *Cychramini*, he had found that in some genera the males differed greatly from the females in size and sculpture; but this was not a constant character, for in some species, while certain males scarcely differed from the females in these respects, others were so different that they would scarcely be recognised as belonging to the same species.

Mr. Edward A. Butler exhibited specimens of *Platymetopius undatus*, Deg., from Ewhurst, Surrey. He remarked that the species was recorded as having been once previously taken near Plymouth by the late Mr. John Scott.

Mr. G. T. Baker read a paper entitled "On the distribution of the *Charlonia* group of the genus *Anthocharis*." Mr. Baker stated that the species, six in number, of this small division of the genus *Anthocharis* formed a very natural and closely allied group, presenting many points of interest, both in their relationship to each other and in their geographical distribution, which extended from the Canaries on the west to the valley of the Indus on the east. The author's theories as to the causes of the present distribution of the group, which were based on geological data, were discussed by Mr. Elwes, Mr. McLachlan, Mr. Distant, and Mr. Stainton.

The Chairman read a paper entitled "On the genus *Argynnis*," which gave rise to a discussion, in which Mr. Distant, Mr. Jenner Weir, and Prof. Riley took part.—H. GOSS, *Hon. Secretary*.

ON THE DISTINCTION BETWEEN *LECANIDINÆ*, *HEMI-COCCIDINÆ*
AND *COCCIDINÆ*.

BY W. M. MASKELL, F.R.M.S.

Mr. Albert C. F. Morgan, in the number of the Ent. Mo. Mag. for May, 1889, p. 275, *ante*, discusses adversely the distinction which, in my "Scale Insects of New Zealand," I have drawn between such genera as *Lecanium*, *Kermes*, *Dactylopius*, and doubts the propriety of my erecting a special group, to which I gave the name of "*Hemi-Coccidinæ*," for the purpose of including only the three genera *Kermes*, *Pollinia* and *Asterolecanium*. I am so far from deprecating controversy on this or kindred matters that I welcome it as another of the signs of the awakening interest of entomologists in the hitherto much neglected family of Coccids; and I have read also with great interest Mr. Morgans's previous papers on the so-called "spinneret-groups" of *Diaspidæ*.

I venture, before proceeding to the precise subject of Mr. Morgan's paper of May, to say one word about my nomenclature of the various groups into which I have divided Coccids—that is, my reason for employing *Diaspidinæ* for *Diaspina*, *Coccidinæ* for *Coccina*, &c., inserting, in fact, an extra syllable. I am quite open to correction if I am wrong, but it did seem to me that a "group-name" should be at the same time correctly expressive, that is, not liable to mislead, and also as comprehensive as possible. Now, the name "*Diaspina*," to most people, if it does not suggest something in connection with spines, would, at least, not point at all to any inflection of the Greek *aspis*, *aspidos* the real root, and the additional syllable "id" seemed therefore necessary. Again, in the Lecanid group, a name was required to include not only the purely *Lecanium* sub-division, but also the genera with waxy coverings. Coccids proper, again, include such different sections as *Rhizococcus* and *Icerya*. I venture, therefore, to plead that there may be at least some method in my doings.

Now, as to the *Hemi-Coccidinæ*. Mr. Morgan, at the outset, is not quite accurate in stating that in my "Scale Insects of New Zealand," published in 1887, I "introduced a new division or sub-family." If he had noticed that, on page 87 of that work, I refer the reader to vol. xvi of the "Transactions of the New Zealand Institute," he might have looked at my paper in that volume (read in October, 1883, the volume being published in May, 1884). He would therein have found the new arrangement of groups, with a very full discussion of the reasons which led me to make it. In point of fact, my book of 1887 is only, as far as the diagnosis of genera and species is concerned, a

brief summary of details given much more fully in my papers in the New Zealand Transactions from 1878 to 1887 ; and in every instance I give a reference to the original paper published. In writing my book I had to remember a good many things besides full scientific accuracy. The New Zealand Government is parsimonious to a degree, and entirely unscientific ; the New Zealand settler is, as a rule, pig-headed to a degree and equally unscientific ; and although I have not the slightest reason to be dissatisfied with the general reception my poor little work met with, yet I have been assailed not unfrequently (by apparently fairly educated farmers and tree growers) for "putting in so much Latin." Anticipating to some extent that this might be the case, I reduced my work as far as possible to the simplest possible form ; one unfortunate result of which is that scientific critics like Mr. Morgan do not notice the references, which were all I could allow myself.

I would gladly forward copies of my papers to Mr. Morgan if I had them ; but the last copy of most of them has been given away, amongst others this very one of 1883. However, I rather think that Mr. J. W. Douglas, of Lewisham, has them all. Anyhow, the New Zealand Transactions are, I think, in the libraries of most of the Scientific Societies in London. My paper of 1878 contains, I am well aware, many egregious errors ; other papers have some too ; but I believe all have been subsequently corrected.

Next, Mr. Morgan, whilst quite correct in stating that no insect of my group *Hemi-Coccidinæ* has been reported from New Zealand, is scarcely justified in proceeding to indicate that I have established "another sub-family without examining the genera proposed to be included." I do not know whence he derived this notion. As a matter of fact, through the kindness of Dr. Signoret, I received, several years ago (probably in 1880), a large collection of European and exotic forms, some of great rarity and beauty. Amongst these were *Kermes vermilio*, Planch., and *Kermes Bauhinii*, Planch. Later on (about 1882) I obtained from South Australia an insect, undoubtedly a true *Kermes*, but still awaiting from its discoverer, Mr. F. S. Crawford, a scientific description. Still later, I obtained specimens of *Asterolecanium quercicola*, Bouché. Of all these four I have examined, microscopically, specimens both of larvæ and adult ; I think, therefore, that my sub-family was scarcely "established without examination of the genera proposed to be included."

But the foregoing matters are, after all, only personal. As regards the question under discussion, I differ from Mr. Morgan as to the

importance of the abdominal characters. Classification and nomenclature are matters of pure convenience. When, in the dim future, the time may perhaps arrive when every single bird, beast, fish, and insect, every plant, every mineral, existing on earth has been seen and described by somebody or other, then the work of the systematist will be reduced to simplifying as much as possible the congeries of Orders, Families, genera and species. And when, in the still dimmer future, somebody shall have found out what a genus and a species are really, then the systematizers' work will be over and the weary student will rest. Until that happy time, as it seems to me, the object of a systematist should be to avoid excessive differentiation, and, at the same time, aim at convenience. The two things are indeed, to some extent, synonymous; and probably those who are so ready to found species and genera upon "a single specimen," "one specimen not in good order," or even "a single mutilated specimen," are storing up mountains of work for which future students will not thank them. But, taking only what one might call the "tertiary" sub-divisions of insects (that is, the divisions of Families), it would seem that the first main character to be fixed on should be one which is *readily visible, organic, and constant*, and it must be *peculiar* to the sub-division.

Thus, for example, amongst Coccids, a covering, waxy, cottony or felted, would not suffice, for it is neither constant nor confined to any group; loss of antennæ or of feet would be similarly insufficient, for examples of either can be found in both *Diaspidæ* and *Coccidæ*. But, as remarked in my paper of 1883, there is one (double) character quite distinctive of the *Lecanidæ*, namely, the presence of an abdominal cleft with two small dorsal lobes. Mr. Morgan confines himself, I see, to the discussion only of the "lobes" as against the "anal tubercles" of *Coccidæ*. I have not done so. I am not prepared to say that Mr. Morgan is wrong in his idea that, throughout the whole Family, the anal tubercles may be taken as existing with various modifications; morphologically he may be right, but I have not studied the point. But, taking them in combination with the "abdominal cleft," there is no species of *Lecanid*, as far as my observations extend (and I have examined many genera beside the New Zealand forms), in which the two together cannot be made out with close approach to certainty.

I will go farther. Allowing that the "lobes" in *Lecanid* larvæ are, proportionately, larger than those of the adult, yet in my experience, I know of no case where they project beyond the anal edge of the body. I have before me, as I write, a microscopic slide, prepared by me in 1877, of *Lecanium hesperidum* taken from a myrtle bush. The

specimen was an adult female, full of larvæ, some just escaping, some just on the point of hatching, some still not fully formed in the egg. I mounted the insect (losing, of course, several larvæ in the process), but in such a way that now there may be seen perhaps thirty larvæ in all stages, some inside the body, some outside. In every case the dorsal lobes are visible, but in no case do they project beyond the body; and the abdominal cleft is conspicuously clear in all which do not happen to be lying on their sides; and this cleft, with the lobes, can be easily made out in every Lecanid specimen which I have seen, whether covered or naked.

Very different is the larva of a *Kermes*, or of a *Dactylopius*, or any other true Coccid. Compare, for example, with what has just been said, the figure of the larval extremity of *Kermes Bauhinii* given by Signoret (Ann. de la Soc. Ent. Fr., 1874, pl. xii), or that of the larva of *Eriococcus hoheriæ* in my "Scale Insects of New Zealand" (plate xiv). Until further evidence is brought I venture to maintain that the presence of an abdominal cleft with non-projecting lobes, and the absence of a cleft while the lobes conspicuously project, are sufficiently clear characters for "group" distinctions.

And, if so, when we find two or three or more genera exhibiting at one stage the characters of one group, while at another they exhibit the characters of another group, are we not justified for the present, and for the sake of convenience, in erecting an intermediate group to contain them? Mr. Morgan quotes, seemingly as adverse to me, a sentence from Dr. Signoret (Ess. s. l. Cocc., p. 301), where he says that *Kermes* presents in the larval state the characters of *Coccidæ*. But what is this more than what I have said in my "Scale Insects?" I fail entirely to see wherein I have offended.

I am quite at one with Mr. Morgan in desiring simplification as far as possible. I have lately discovered in this country two, if not three, species of *Gossyparia*, Sign., and I have had the opportunity of examining specimens of *Nidularia pulvinata*, Planch., from Europe, and *Capulinia Sallei*, Sign., from Mexico. So far, I rather incline to the belief that some day it may be well to unite all these to *Eriococcus*, but the point is not easy to decide.

Some genera remain up to the present a puzzle, and it is difficult to see where to place them; for example, *Carteria lacca*, Sign., or *Xylococcus filiferus*, Löw. And the *Brachyscelidæ* have never yet been fully studied, though I believe that Mr. Olliff, of Sydney, proposes to work them up.

The departure of the mail in a couple of days deprives me of the power of attaching to these notes figures, from my own specimens, of the points referred to above. In concluding, let me express the hope that Mr. Morgan's papers are only an earnest of an awakening interest amongst English entomologists for the Coccids.

Wellington, New Zealand:

June 25th, 1889.

SYNOPSIS OF THE BRITISH ORTHOPTERA.

BY ELAND SHAW, F.E.S.

(Continued from p. 372).

III.—ACRIDIIDÆ.

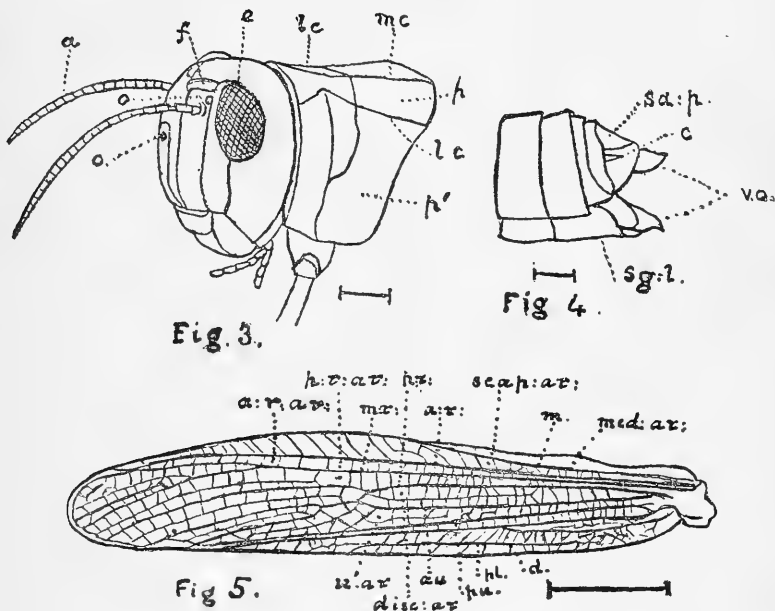


Fig. 3.—Head and pronotum of *Stenobothrus bicolor*, Charp. *a*, antennæ; *o*, ocelli; *f*, foveolæ of the vertex; *e*, eye; *p*, *p'*, pronotum; *lc*, lateral ridges of pronotum; *mc*, median ridge of pronotum. (This fig. is somewhat diagrammatic).

Fig. 4.—Apex of the abdomen of *St. bicolor*, Charp., ♀. *sa p*, supra-anal plate; *c*, cerci; *v o*, valves of the ovipositor; *sg l*, subgenital lamina.

Fig. 5.—Left elytron of *St. bicolor*, ♂. *m*, mediastinal vein; *a r*, anterior radial vein; *m r*, middle radial vein; *p r*, posterior radial vein; *a u*, anterior ulnar vein; *p u*, posterior ulnar vein; *d*, dividing vein; *pl*, vena plicata; *med ar*, mediastinal area; *scap ar*, scapular area; *a r ar*, anterior radial area; *p r ar*, posterior radial area; *disc ar*, discoidal area; *u ar*, ulnar area; *an ar*, anal area.

This is the most numerously represented Family amongst the British *Orthoptera*, and includes the common field grasshoppers. The

species (especially of the genus *Stenobothrus*) are rather more difficult to distinguish than in the other Families. Coloration is not to be depended on, but notice should be directed rather to the form and structure of the vertex and frons; the configuration of the lateral carinæ of the pronotum; the direction of the veins and the shape of the areas of the elytra; and the external genital organs.

The head (fig. 3) is not covered by the anterior border of the pronotum as in the *Blattidæ*, and is in our genera short; the antennæ (*a*) are short, and never have more than twenty-five joints. The top of the head is the vertex, the anterior margin of which has a small oblong-shaped depression on either side the foveolæ (*f*), these are more or less strongly marked in different species, and their propinquity to each other anteriorly should be noticed. Below the vertex is the frons bearing the antennæ in a deep furrow or sulcus on either side, and with a central furrow, near the top of which is one of the ocelli (*o*), the other two being situated between the base of the antennæ and the eyes. The eyes (*e*) are more or less prominent in different species. The pronotum (fig. 3, *p p'*) is the dorsal plate of the first thoracic segment, and consists of an upper part or disc (*p*) and two lateral flaps (*p'*). On the disc are three ridges, a median (*m c*) and two lateral (*l c*), and the curvature of the latter gives us several specific characters. Crossing the disc from side to side is the cross furrow (not lettered in the fig.), which is prolonged down across the side flaps, and turning forwards, unites with another furrow which is not of importance. The situation of the cross furrow must be noticed, as its position with regard to the anterior and posterior borders of the pronotum is of importance. The posterior border of the pronotum is generally bluntly angled, but in *Tettix* extends backwards into a long pointed process. The posterior femora are strong and thick, and are used for jumping; the tarsi are three-jointed, and (except in *Tettix*) have a small pad or cushion between the claws.

The first abdominal segment has on each side an opening (more or less closed), the tympanum or external auditory orifice. The apex of the abdomen (fig. 4) and the external genitals also give important characters. The sexes can be readily distinguished by the form of the external genital organs; the ♀ always having an ovipositor consisting of four plates or valves (*v o*) which protrude beyond the supranal plate (*sa p*), and subgenital lamina (*sg l*); while in the ♂ the subgenital lamina is always recurved and more or less pointed, and forms the apex of the abdomen.

Fig. 5 shows the elytron of *St. bicolor*, Charp., ♂. The venation of which may be taken as typifying that of the *Orthoptera* generally. The veins from before backwards are the mediastinal (*m*) running usually about two-thirds the length of the elytron. The anterior radial (*a r*); the middle radial (*m r*) with numerous branches running to the apex; the posterior radial (*p r*), forming the upper border of the discoidal area: these three are separate veins, but towards the base are almost confluent. The anterior ulnar (*a u*) forming the lower border of the discoidal area; the posterior ulnar (*p u*) running close alongside the dividing vein (*d*), which is the "*vena analis*" of L. Fischer; and lastly the "*vena plicata*" (*pl*), Brunner. These veins divide the elytron into the following areas:—the mediastinal (*med ar*) between the mediastinal vein and the costal margin, this area is sometimes dilated anteriorly

towards the base; the scapular (*scap ar*) between the mediastinal and anterior radial veins; the anterior radial (*a r ar*) between the anterior and middle radial veins, this is the "*area externomedia*" of Fischer and Brunner; the posterior radial (*pr a r*) between the posterior and middle radial veins (*area sub-externomedia*, Fischer); the discoidal (*disc ar*) between the posterior radial and anterior ulnar veins; the ulnar (*u ar*) between the two ulnar veins (*area interulnaris*, Brunner); and the anal (*an ar*). I have ventured to give the names anterior radial, posterior radial, and ulnar to these areas, because it seems advantageous that the areas should be named in relation to the veins; L. Fischer had them so, but his names were very cumbersome, and while Brunner and the more modern writers have adopted the terms radial and ulnar as applied to the veins, they still retain Fischer's names for some of the areas, and it seems to me that the names which I suggest are wanted to complete the system.

The stridulation in the *Acridiidae* is produced by the rubbing together of the posterior femora and tibiae and the side of the folded elytron. The sound varies in intensity in different species, and some of the common grasshoppers (*Stenobothrus*) may be thus distinguished even when not in sight. In *St. bicolor* and *St. parallelus* the sound seems to be produced both at the upward and downward stroke of the limb; but in the former it is harsher, louder and longer, while in *St. viridulus* the sound is only produced, or at any rate only heard, at the downward stroke. These differences though slight soon become familiar to the ear, and are very useful when collecting. When stridulating the insect carries the tibia folded up close to the lower border of the femur.

August and September are the best months for collecting; before the middle of August many of the insects are immature.

TABLE OF GENERA.

- | | | | |
|----|------|--|---------------------------|
| 1 | (10) | Tarsi with a pad between the claws; pronotum never produced beyond the metanotum. | |
| 2 | (9) | Prosternum plain. | |
| 3 | (8) | Mediastinal and scapular areas of the elytra with the transverse veins parallel. | |
| 4 | (5) | Foveolæ of the vertex almost absent, or forming a small triangular depression behind | i. <i>Mecostethus</i> . |
| 5 | (4) | Foveolæ of the vertex well marked, oblong. | |
| 6 | (7) | Antennæ filiform | ii. <i>Stenobothrus</i> . |
| 7 | (6) | Antennæ clubbed at the apex | iii. <i>Gomphocerus</i> . |
| 8 | (3) | Mediastinal and scapular areas of the elytra irregularly veined... | iv. <i>Pachytylus</i> . |
| 9 | (2) | Prosternum with a central cone-shaped protuberance | v. <i>Schistocerca</i> . |
| 10 | (1) | Tarsi without a pad between the claws; pronotum produced backwards into a long process | vi. <i>Tettix</i> . |

i.—MECOSTETHUS, Fieber.

Only the basal part of the foveolæ of the vertex is seen in *Mecostethus*, and these form small triangular depressions with their bases towards the eyes. They are fairly well marked in some specimens, but almost obsolete in others.

1.—MECOSTETHUS GROSSUS, Linné.

Gryllus (Locusta) grossus, Linné, Syst. Nat., i, p. 702 (*nec* Berkenhout, *nec* Stephens); Fabr., Ent. Syst., ii, p. 61.

Acrydium grossum, Latr., Hist. Nat. Crust. et Ins., xii, p. 155.

Œdipoda grossa, Serv., Orth., p. 741.

Gomphocerus grossus, Burm., Handb. der Ent., ii, p. 651.

Mecostethus grossus, Fieb., Synops. Lotos, iii, p. 99; Brunner, Prod. der Eur. Orth., p. 94, fig. 24.

Stetheophyma grossum, Fischer, Orth. Europ., p. 357, tab. xvi, figs. 3, 3a; A. White, Brit. Mus. List, xvii, p. 16.

Gryllus (Locusta) flavipes, Gmelin, Syst. Nat. Linné, ed. xiii, tom. i, part iv, p. 2088, No. 230; Donovan, Nat. Hist. Brit. Ins., xii, p. 87, tab. 391.

Locusta flavipes, Steph., Illust. Brit. Ent. Mandib., vi, p. 21.

Gryllus germanicus, Stoll, Repres., tab. xxiii b, fig. 89.

Acridium rubripes, De Geer, Mém., iii, p. 477, tab. xxii, fig. 4.

Head with the vertex produced triangularly and thickly margined, foveolæ almost absent, or basal and triangular. Antennæ filiform, longer comparatively in ♂ than in ♀. Pronotum with the median ridge strongly marked and somewhat raised; transverse furrow rather anterior to the middle, strongly rugose behind that; posterior margin bluntly rounded. Elytra clear with smoky apices, veins ferruginous, radial veins fuscous towards the base, mediastinal area extending beyond the middle of the elytra, and together with the scapular area is bright yellow; discoidal area with an accessory vein nearer the ulnar than the radial veins. Wings hyaline, smoky towards the apex. Posterior femora of a rosy-red beneath, with a black streak (sometimes divided into two parts) internally, knees black. Posterior tibiæ yellowish, spines black. Valves of the ovipositor ♀ elongate, with several small crenulations above. Length, ♂, 13—23 mm.; ♀, 26—33 mm.

In the British Museum Collection there are several British examples of this species labelled *flavipes*, Gmel., and there are also some in the Dublin Natural History Museum; these are all *grossus*, L., and I think the mistake about the name must have arisen through Donovan giving Gmelin's name to this species, of which he gives a good figure. The name in Gmelin's Syst. Nat. Linné, ed. xiii, is applied to an insect of Leske's Museum, and Gmelin copies Zschach's description in Karsten's "Museum Leskeanum," p. 49, No. 50. Donovan makes no mention of *grossus*, L., but Stephens, Mandib., vi, includes both *grossa*, L., and *flavipes*, Gmel., and he says of *grossa*, "Berkenhout gives this as British, but I presume improperly, as I have never seen an indigenous example." Berkenhout's description, however (Synopsis Nat. Hist. Gt. Brit. and Ireland, i, p. 112, No. 7), seems to refer to some species of the genus *Stenobothrus*. Stephens says of *flavipes* that it is not uncommon in marshes in this country, but supposes, from the silence of continental authors, that it is peculiar to Britain. I have two modern records of the capture of this fine species: one, a specimen kindly given me by Mr. McLachlan, was taken in the fens of Norfolk a few years since; and Mr. H. N. Ridley took one on the road between Glencar and Waterville in Co. Kerry: he recorded it in the Ent. Mo. Mag., vol. xx,

p. 215, but as *Pachytylus cinerascens*, Fab., probably after referring to L. Fischer's work, where *flavipes*, Gmel., is given as synonymous with *cinerascens*, Fab., and this specimen is now in the British Museum Collection, amongst the others labelled *flavipes*. Fischer most likely never saw Donovan's figure or description, and gives the reference to him "teste Steph." (Orth. Eur., p. 395). Brunner, in his Prod. der Eur. Orth., seems simply to have copied Fischer's mistake, and he quotes Donovan as calling the species *Pachytylus flavipes*, whereas Donovan called it *Gryllus flavipes*, the name *Pachytylus* of course not having been proposed by Fieber until about fifty years later.

M. grossus is distributed widely over Northern Europe and in Spain in marshy localities, and will, I expect, be found fairly plentiful in our fen districts when properly looked for.

ii.—STENOBOTHRUS, Fischer (figs. 3, 4, 5).

This genus includes our common field grasshoppers. There are found in Europe, according to Brunner, 27 species, and of these six at any rate occur in Britain. Stephens (Mandib., vi) describes many others, in several cases copying correct descriptions from Charpentier while applying them to specimens to which a more careful examination at once shows they could not refer. The British Museum Collection, and some of the old collections which I have had an opportunity of examining during the last few years, were in an almost hopeless state of muddle; several distinct species being in some cases included under one name, and on the other hand, one species has been split up under many different names. Stephens described several species as new, depending chiefly on difference in coloration, but this is of scarcely any specific value, and not only is this so with regard to the genus *Stenobothrus*, but also in all the *Orthoptera*; the differences in coloration seem to be chiefly protective (*vide St. parallelus*, *infra*).

Brunner divides the genus into five groups, which will be found very useful in identifying the species, they are—

1. The group of *St. lineatus*, Panz., with a tooth at the base of the ovipositor, and strikingly greater discoidal area with regular reticulations.
2. The group of *St. morio*, Fab., with the peculiarity that the two ulnar veins though divided at the base unite again after a short distance. (We have no representative of this group, unless *St. apricarius* should prove British).
3. The group of *St. viridulus*, L., with the narrow undilated marginal area.
4. The group of *St. biguttulus*, L., with the dilated marginal area and prominent lateral carinæ.
5. The group of *St. elegans*, Charp., and *St. parallelus*, Zett., with dilated marginal area and almost parallel ridges of the pronotum.

In this genus the vertex is triangular and is not produced far forward, the foveolæ are well marked and are generally of an oblongo-rhomboidal shape, with the

corners, especially the anterior ones, rounded off; the edge of the frons, as seen from the side, is convex. The antennæ are filiform. The pronotum has a transverse furrow about the middle dividing the median longitudinal ridge, and there are three ridges, a median (fig. 3, *mc*), and two lateral ones (*lc*), the latter being more or less curved in the different species. The elytra are generally perfectly developed, though sometimes abbreviated (*St. parallelus*, Zett.), the mediastinal area extends more or less outwards, and is sometimes dilated at the base and sometimes includes an adventitious vein; the scapular area has oblique parallel transverse veins. There are three radial and two ulnar veins (fig. 5), the latter being sometimes coalescent (*St. lineatus*, Panz.). The dividing vein is straight. The wings are generally perfectly developed. The posterior tibiæ are generally testaceous, sometimes reddish. The first abdominal segment has a closed tympanum (external auditory organ). Supra-anal plate (fig. 4, *sa p*) in ♂ triangular. Subgenital lamina ♂ curved upwards, more or less sharp. The valves of the ovipositor are four, they are short, are always extruded, and sometimes have an external lateral tooth at the base. The ♀ is considerably larger than the ♂.

TABLE OF SPECIES.

- | | | | |
|----|------|--|------------------------------|
| 1 | (2) | Valves of the ovipositor with an external basal tooth; discoidal area with regular reticulation | 1. <i>lineatus</i> , Panz. |
| 2 | (1) | Valves of the ovipositor plain; discoidal area irregularly reticulated. | |
| 3 | (6) | Mediastinal area narrow, not dilated at the base; extending far beyond the middle of the elytra. | |
| 4 | (5) | Elytra never spotted, palpi unicolorous .. | 2. <i>viridulus</i> , Linné. |
| 5 | (4) | Elytra generally spotted, palpi white at apex..... | 3. <i>rufipes</i> , Zett. |
| 6 | (3) | Mediastinal area shorter; dilated at the base. | |
| 7 | (8) | Lateral ridges of the pronotum sharply angled anterior to the cross furrow, diverging considerably beyond it | 4. <i>bicolor</i> , Charp. |
| 8 | (7) | Lateral ridges of the pronotum very slightly curved or nearly straight. | |
| 9 | (10) | Elytra and wings perfectly developed | 5. <i>elegans</i> , Charp. |
| 10 | (9) | Elytra fully developed in ♂, abbreviated in ♀; wings abbreviated in both sexes | 6. <i>parallelus</i> , Zett. |

1.—STENOBOTHRUS LINEATUS, Panz.

Gryllus lineatus, Panz., Faun. Ins. Germ., fasc. xxxiii, tab. 9.

Locusta lineata, Steph., Mandib., vi, p. 26.

Stenobothrus lineatus, Fischer, Orth. Europ., p. 325, tab. xvii, figs. 1, 1a; Brunner, Prod. der Eur. Orth., p. 104.

Head large; foveolæ of the vertex not much depressed, antennæ longer in the ♂ than in ♀, filiform, testaceous. Vertex sometimes bordered with a rosy streak. Pronotum with the lateral ridges slightly angled about midway between the cross furrows and the anterior margin, together with the head generally greenish, lateral furrows pale, sometimes bordered internally with rosy, and crossed from without inwards by a longitudinal black streak. Elytra hyaline, green at the posterior third, apices smoky; mediastinal area extending along about two-thirds of their length, undilated; scapular area occupied by a whitish streak in ♀; middle radial vein bent upwards towards the apex, forming a broad posterior radial area. Anterior

ulnar vein coalescent with the posterior one; discoidal area very broad, regularly reticulated. The elytra, at about the junction of their outer and middle third, have a crescentic whitish spot, with the concavity inwards. Wings smoky at the apex. Posterior femora green above, reddish below; knees fuscous; posterior tibiæ sanguineous, spines fuscous. Apex of the abdomen reddish in ♂. Valves of the ovipositor ♀ with an external tooth. Length, 15—25 mm.

This insect is generally distributed all over Europe, and I have specimens from several localities in the South-Eastern Counties of England. It should be looked for about August in dry meadows, and though local will, I expect, be found fairly plentiful.

In the British Museum Collection I found sixteen specimens labelled *lineatus*, Panz., but none of them were of this species, while among the *viridulus*, L., were two genuine *lineatus*, Panz.

2.—STENOBOTHRUS VIRIDULUS, Linné.

Gryllus viridulus, Linné, Faun. Suec., p. 238; Syst. Nat., p. 702.

Locusta viridula, Steph., Mandib., vi, p. 24.

Lo. rubicunda, *ibid.*

Lo. stigmatica, Steph., Brit. Mus. Coll. (*non* Rambur).

Stenobothrus viridulus, Fischer, Orth. Eur., p. 329, tab. xvi, figs. 15, 15a; Brunner, Prod. der Eur. Orth., p. 111, fig. 28 E.

Colour green; ♀ sometimes with fuscous, sometimes with rosy-red markings. Vertex with a very short longitudinal central ridge at the apex; antennæ testaceous, darker at apex, filiform, longer in ♂ than in ♀; palpi concolorous. Pronotum with the lateral ridges angled very slightly near the anterior border, and approximating there, somewhat thickened posteriorly, crossed from without inwards by a broad black streak. The lateral ridges are usually pale, the median one green. Elytra with the anterior part fuscous in the ♂, of a rosy tint in ♀; posterior part green in both sexes. Mediastinal area reaching beyond the middle of the elytra, narrow, undilated at the base; discoidal area with the reticulations sub-regular; ulnar veins diverging from the base. Wings in both sexes with the apical half more or less smoky. Posterior femora generally green, sometimes deep rosy-purple, knees concolorous, posterior tibiæ testaceous, sometimes rosy, spines fuscous at the tip. Valves of the ovipositor without an external tooth. Length, 15—24 mm.

This species also is widely distributed over Europe, and is found in Siberia and Amur. I have specimens from all over England and from Wales, and have taken it in Co. Dublin and Co. Limerick in Ireland. It seems to be commonest on elevated grass lands; this year I have found it abundant on Dartmoor and in the neighbourhood.

There is a form of the ♀ with the sides of the head and pronotum, all the legs and the anterior part of the elytra, of a deep rosy colour. This may have been Stephens' *rubicunda*, but his specimens in the British Museum Collection cannot, I

think, be distinguished from *viridulus*, L. Of this form I have specimens from Yarmouth (Mr. H. Winston), and Louth (Mr. Wallis Kew). There were some specimens of this species in the British Museum Collection labelled *stigmaticus* by Stephens. They are certainly not the *stigmaticus* of Rambur (Faune de l'Andalousie, p. 39). Stephens, in Mandib., vi, does not mention *stigmaticus*; but his description of *Lo. aprica* at p. 24 probably refers, as Brunner queries, to Rambur's species. The specimen in the Collection labelled *aprica* in Stephens' writing is *St. elegans*, Charp.

3.—*STENOBOTHRUS RUFIPES*, Zett.

Gryllus rufipes, Zett., Orth. Suec., p. 90.

Locusta rufipes, Steph., Mandib., vi, p. 25.

Stenobothrus rufipes, Fisch., Orth. Eur., p. 331, tab. xvi, figs. 16, 16a ; Brunner, Prod. der Eur. Orth., p. 113.

Head fuscous, dark olive-green above. Antennæ rather paler; palpi white at the apex; frons slightly convex, deeply furrowed centrally. Pronotum with the sides dark fuscous with a few pale markings, disc pale in the centre with a broad black streak on each side, interrupted by the lateral ridges, which are paler and are angled near the anterior margin, scarcely diverging anteriorly; the cross furrow is rather nearer the anterior than the posterior border. Elytra with the part anterior to the ulnar veins dark fuscous, with a few paler markings in the discoidal area; and the part posterior to the ulnar veins testaceous in ♂, green in ♀. Wings smoky at the apex. Posterior femora fuscous outside, with some pale markings, sometimes very dark above, sometimes all sanguineous; knees and base of tibiæ fuscous; posterior tibiæ sanguineous in ♂, fusco-testaceous in ♀, with a pale band below the knee. Abdomen in ♂ dark fuscous above at the base, and at the sides often sanguineous, base below yellow; in ♀ fuscous above, sanguineous below, yellowish at base. Valves of the ovipositor without an external tooth. Length, 14—20 mm.

I have always found *rufipes* on open heathy ground just on the outside of a wood or plantation; and Mr. C. O. Waterhouse tells me he has taken it in clearings in woods. It seems to be not at all common, though cannot be said to be rare; it has occurred recently at Wotton (Gloucestershire), New Forest, Bromley, and Herne Bay, and Mr. Porritt has taken it near York and on Penmaenmawr. It is distributed generally all over Europe, from Sweden to the Mediterranean.

There were a number of specimens labelled *rufipes* in the British Museum Collection, but most of them were *viridulus*, L.

Rufipes is most likely to be confused with *viridulus*, L., but is generally of a much darker colour, the white palpi show up distinctly, and the elytra are spotted in the discoidal area, and, with the sanguineous abdomen, readily separate it. Sometimes the ♂ *bicolor*, Charp., has the apex reddish, but the much more sharply curved angles of the lateral ridges of the pronotum at once distinguish it from *rufipes*, Zett.

Our form of this species is much darker than the continental specimens in my possession; and I have taken it around Paris as pale or paler than *viridulus*, L.

4.—*STENOBOTHRUS BICOLOR*, Charp. (figs. 3, 4, 5).

Gryllus bicolor, Charpentier, Horæ Ent., p. 161.

Locusta vittata, miniata, biguttula, mollis, hæmorrhoidalis, rhomboidea, varipes, venosus, Steph., Mandib., vi, pp. 25—28.

Stenobothrus variabilis, Fischer, Orth. Eur., p. 342, tab. xvi, figs. 7, 7a—d.

Stenobothrus bicolor, Brunner, Prod. der Eur. Orth., p. 120, fig. 28 G.

Colour variable, usually fuscous with paler and darker markings, sometimes green reddish-purple, or almost black. Head with the foveolæ of the vertex well marked; antennæ of equal length in both sexes. Vertex triangular; frons with the median sulcus deep, and extending further up in ♂ than in ♀. Pronotum with the cross furrow nearer the anterior than the posterior border (fig. 3), lateral ridges sharply angled rather behind the middle of the anterior part of the pronotum, diverging towards the anterior and posterior borders. Elytra reaching beyond the apex of the abdomen, with the mediastinal area dilated near the base; scapular area in ♀ with the transverse veins much bent and joining one another, sometimes forming a spurious vein, often occupied by a whitish streak; anterior radial area (fig. 5, *a r ar*) not dilated in ♂, anterior and middle radial veins running very straight. Wings hyaline, sometimes slightly smoky towards the apex. Posterior femora testaceous, fuscous, sometimes green or reddish-purple, or yellow beneath, with a black streak inside at the base; posterior tibiæ testaceous or ferruginous. Abdomen dark fuscous at the base above, apex frequently red in ♂, below yellow or pale fuscous, sometimes darker. Valves of the ovipositor without an external tooth. Length, 14—24 mm.

This species is very abundant all over the country. I have found it commonest round the sea coast, and often hundreds may be seen on a sunny bank or waste place. It does not occur in woods.

Much confusion has existed between this species and the closely allied *St. biguttulus*, Linné, and a large part of the older literature about *biguttulus* ought probably to be referred to this species, which is much commoner and much more widely distributed. Brunner, in distinguishing between them, says *biguttulus* differs from *bicolor* in that the elytra of ♂ have the marginal vein stronger, fuscous, and at the apex at its junction with the radial vein has a fuscous patch; the externo-medial (ant. rad.) area is dilated by the bending of the anterior and middle radial veins; and the cross veins in this area are closer together; and in ♀ the cross veins of the scapular area are not confluent. He also says *biguttulus* occurs in woods and *bicolor* in the open.

I have not been able to find *biguttulus*, L., in this country, but there seems no reason why it should not occur here.

Of the green form, *mollis*, Charp., and the reddish-purple one, *purpurascens*, Fieb., I have several specimens.

5.—*STENOBOTHRUS ELEGANS*, Charp.

Gryllus elegans, Charp., Horæ Ent., p. 153.

Locusta montana (B. M. Coll.), *tricarinata*, *aprica* (B. M. Coll.),
? *dorsata*, Steph., Mandib., vi, pp. 22—24.

Stenobothrus elegans, Fisch., Orth. Eur., p. 318, tab. xvi, figs. 11, 11a, b;
Brunner, Prod. der Eur. Orth., p. 125, fig. 28 H.

Colour green or testaceous with fuscous markings, sometimes reddish. Head with the vertex convex, with a longitudinal central line, foveolæ strongly marked; antennæ longer in ♂ than in ♀. Pronotum with the ridges well marked, nearly parallel, but the two lateral ones slightly approximating in the middle, and slightly diverging behind. Elytra with the mediastinal area dilated at the base, very narrow; scapular area narrow. Anterior radial area very narrow, especially in ♂; posterior radial area considerably dilated in ♂, less so in ♀; discoidal and ulnar areas about the same breadth in the middle of the wing. Elytra and wings rather longer than the abdomen in ♂. Wings hyaline, veins reddish-fuscous. Posterior femora concolorous, posterior tibiæ testaceous or livid. Valves of the ovipositor without an external basal tooth. Length, 14—20 mm.

This species, widely distributed in Central Europe, will, I think, be found not uncommon in this country. It occurs on Wormwood Scrubs, and has been found in several localities in the southern counties and at Penmaenmawr, and Mablethorpe, Lincolnshire.

Stephens' description is copied from Charpentier, but his specimens labelled *elegans* in the British Museum Collection are *parallelus*, Zett.

I have not been able to find any old or recent specimen of *dorsatus*, Zett. Stephens had specimens of *parallelus* labelled *ochropa*, and in Mandib., vi, p. 22, he gives *ochropa* as synonymous with *dorsata*.

6.—*STENOBOTHRUS PARALLELUS*, Zett.

Gryllus parallelus, Zett., Orth. Suec., p. 85.

Locusta parallela (*ochropa*), Steph., Mandib., vi, pp. 22, 23.

Podisma pedestris, Steph., B. M. Coll., non Mandib., vi, p. 29.

Gryllus montanus, Charp., Horæ Ent., p. 173 (*var.*).

Chorthippus pratorum, Fieb., Syn., p. 16.

Stenobothrus pratorum, Fisch., Orth. Eur., p. 321, tab. xvi, figs. 13, 13a—d.

Stenobothrus parallelus, Brunner, Prod. der Eur. Orth., p. 127.

Colour very variable, green, fusco-testaceous or entirely red, abdomen below yellow. Head with the frons prominent, foveolæ not well marked. Antennæ robust, longer in ♂ than in ♀; vertex sub-convex above. Pronotum with the transverse furrow nearer the posterior than the anterior border; lateral ridges nearly parallel, or slightly angled about the middle of the anterior portion of the pronotum, and slightly diverging behind. Elytra unicolorous, nearly clear, with pale fuscous veins; reaching in ♂ not quite to the end of the abdomen; in ♀ short, lanceolate, reaching

about as far as the third abdominal segment. Wings much shorter than the elytra in both sexes, hyaline. Posterior femora with the knees fuscous. Valves of the ovipositor without an external basal tooth. Length, 13—25 mm.

Parallelus is found everywhere in meadows and open ground. In colour it is extremely variable, and this is most marked in ♀. I believe in this species, as in many other *Orthoptera*, the variation in colour is to a great extent protective; the ♀ does not fly, and I have always found that the prevailing colour of the ground vegetation is closely copied in the insect. Specimens entirely green above or entirely red are found confined to patches of the same colour, though within a few yards of one another, and again, the two colours are sometimes so mixed, that it is very difficult to see the insect when on a like-coloured vegetation; this I noticed particularly on the top of the West Cliff at Bournemouth.

Charpentier's *montanus* is a variety, with the wings and elytra perfectly developed in both sexes. I have not found it in this country. Stephens' description of *Lo. montana* doubtless refers to this variety, but his specimen so labelled is *elegans*, Charp.

Podisma pedestris, L.—Stephens (Mandib., vi, p. 29) describes this as British, his description no doubt is all right, but his specimens, of which there was a long series, in the British Museum are all *parallelus*, Zett., ♀. Some time ago Dr. Henri de Saussure, of Geneva, kindly sent me specimens of *Pezotettix pedestris*, L., and they are quite distinct from anything we have here; but the general distribution of the species in Europe may justify us in the hope of re-establishing it as British.

iii.—GOMPHOCERUS, Leach.

This genus differs from *Stenobothrus* in the antennæ being clubbed at the tip; the tympanum on the first abdominal segment is partly open, and the pronotum, compared with the length of the insect, is not so long.

TABLE OF SPECIES.

- | | | | |
|---|-----|--|------------------------------|
| 1 | (2) | Elytra with the mediastinal area dilated at the base; antennæ whitish at the tip | 1. <i>rufus</i> , Linné. |
| 2 | (1) | Elytra with the mediastinal area undilated at the base; antennæ concolorous | 2. <i>maculatus</i> , Thunb. |

1.—GOMPHOCERUS RUFUS, Linné.

Gryllus rufus, Linné, Syst. Nat., i, 2, p. 702.

Stenobothrus (*Gomph.*) *rufus*, Fischer, Orth. Eur., p. 248, tab. xvii, figs. 9, 9a.

Gomphocerus rufus, Steph., Mandib., vi, p. 30, pl. xxviii, fig. 6; Brunner, Prod. der Eur. Orth., p. 131.

General colour reddish-fuscous, with some paler markings. Antennæ with the tip of the clubbed part acuminate and whitish. Foveolæ of the vertex small; frons produced forwards above, pale with fuscous markings, with the median sulcus not

extending above the ocellus. Pronotum above reddish-fuscous or pale with fuscous marbling, and a black streak on either side divided by the lateral ridges, cross furrow about equidistant from the anterior and posterior borders; lateral ridges angled about half way between the anterior border and the cross furrow, diverging anteriorly and posteriorly. Elytra unicolorous, with the mediastinal area dilated at the base, and extending for about two-thirds the length of the elytra. Scapular area broad, mediastinal vein arching upwards. Wings somewhat smoky towards the apex. Hind femora reddish, with fuscous markings. Hind tibiæ reddish, with spines fuscous at the tip. Abdomen above fuscous or reddish, below yellow. Valves of the ovipositor short. Length, 14—20 mm.

Local; Maidstone, Boxhill, Reigate. Generally distributed in north and middle Europe.

2.—*GOMPHOCERUS MACULATUS*, Thunb.

Gomphocerus maculatus, Thunb., Mém. Acad. St. Petersb., v, p. 221.

Gryllus biguttulus, Panz., Faun. Ins. Germ., fasc. xxxiii, tab. 6.

Gomph. biguttatus, *elegans*, *ericetarius*, *calidoniensis*, *apricarius*, Steph., Mandib., vi, pp. 30—32.

Stenobothrus (*Gomph.*) *biguttatus*, Fischer, Orth. Eur., p. 346, tab. xvii, figs. 10, 10a.

Gomph. maculatus, Brunner, Prod. der Eur. Orth., p. 132.

Colour fuscous, or greenish with fuscous markings. Head with the foveolæ of the vertex large, well marked, and nearly meeting in front, frons with the central sulcus small, only a depression around and below the ocellus. Antennæ concolorous. Pronotum with the cross furrow nearer the anterior than the posterior border, lateral ridges with a deep broad angle about the middle of the anterior half of the pronotum, crossed by a black streak. Elytra with the mediastinal area undilated at the base; scapular area narrow; a yellow streak sometimes occupying the ulnar area, ulnar area sometimes pale; anterior ulnar vein much nearer the posterior ulnar vein than the posterior radial vein; discoidal area with some pale spots. Wings smoky at the apex and for the external third of the anterior border. Posterior femora fuscous or reddish-brown, with pale markings, or green above, fuscous at the sides below. Knees fuscous. Posterior tibiæ testaceous with fuscous spots, and a paler band below the knee, with abundant long hairs. Valves of the ovipositor short.

Length, 12—16 mm.

Generally distributed in Europe, from Lapland to Servia, also in Spain (Bolivar). In England I have found it fairly common in the southern counties; abundant in some places. Epping Forest, Lincolnshire (Mr. Wallis Kew), Yorkshire (Mr. Porritt).

Maculatus is easily distinguished from *rufus* by its smaller size, undilated mediastinal area, generally spotted appearance, and the apices of the antennæ are not tipped with white. The clubbing of the antennæ is well marked in ♂, almost obsolete in ♀.

Stephens' names depended on differences of coloration.

Gomphocerus sibiricus, Linné, Syst. Nat., i, 2, p. 701.—Stephens (Mandib., vi, p. 32) describes this as British, and says "it is in Mr. Hope's rich collection, taken on the hills near Netley," but without further confirmation, I do not think we can include it in our fauna. Brunner says (p. 132) "Habitat, in meadows on high mountains, in northerly (*sic*) England (Stephens), ? Hartz (Panzer), ? Dresden (Fieb.). In the Alps in many places, in the southern parts, but never under 1200 mètres, therefore always in the region of the Alpine rose," &c. He also records it from the Apennines, Pyrenees, Caucasus, Siberia, &c. I do not think we can expect it to occur on our S. English downs.

(*To be continued*).

TRICHOPTERA COLLECTED IN ICELAND BY MR. P. B. MASON IN
THE SUMMER OF 1889.

BY ROBERT McLACHLAN, F.R.S., &c.

During his excursion in Iceland from June 21st to July 18th of the present year, Mr. P. B. Mason, M.R.C.S., F.L.S., collected nearly 100 examples of *Trichoptera*, which he placed in my hands for examination. The result is as follows:—

Fam. *PHRYGANEIDÆ*.

Agrypnia islandica, Hag. Reykjavik, 2 ♂.

The two examples before me strongly resemble *A. Pagetana* in general appearance, but the anterior-wings are slightly smoky, and their neuration very strong and black. In structural characters they are exceedingly like *A. picta*.

N.B.—When I wrote my "Revision and Synopsis" I had not seen this species; the description (p. 29) was drawn up from that by Hagen (Verhand. zool.-bot. Wien, 1873, p. 129), and the figures (pl. iv) were reproduced from drawings kindly lent to me by him, taken from a ♂ in his collection. On comparing the details with Mr. Mason's examples I find discrepancies, the chief of which is the absence of the triangular tooth at the base of the apical club of the inferior appendages (indicated both in description and figure). A careful and prolonged examination under the microscope has failed to reveal this tooth; an illusion caused by the black hairs clothing the inner-side of the club occasionally simulated a tooth, but it vanished on further search. On the other hand, there is a triangular tooth-like projection of the oblique apical edge of the lower joint of these appendages, but it is directed outward and upward, not downward. I can scarcely think that two very closely allied species exist in Iceland, and leave the matter for further investigation. Examples of *A. islandica*, from the original source, are recorded as to be found also in the Berlin and Vienna Museums.

Fam. *LIMNOPHILIDÆ*.

Grammotaulius atomarius, F. Reykjavik, 3 ♂, 1 ♀.

The structural characters agree entirely with British examples,

and in three of the specimens the general appearance is the same, save that the spines of the legs are darker, almost blackish in certain lights. But one ♂ is an extraordinary melanic colour-variety. In this the anterior-wings may be described as *black*, with black neuration; the costal margin (costal and sub-costal areas) is whitish as far as the pterostigmatic region; there is a small, oblique, whitish, fenestrated spot, and an irregular, whitish, anastomosal space divided into six or seven spots by the dark veins of the anastomosis; furthermore, there are a number of minute whitish dots scattered over the dark ground. In the posterior-wings the neuration is black, and the line on the 4th apical sector is deep black. I now think it highly probable that Zetterstedt's *interrogationis* from Greenland was founded on a somewhat similar melanic form.

N.B.—Hagen (Verhand. zool.-bot. Wien, 1873, p. 449) indicates a species from Iceland (without name), in the Berlin Museum, allied to *G. nitidus*, Müll., but smaller. Brauer (Neurop. Europ., 1876) gives Iceland, doubtfully, as a locality for *nitidus*.

Limnophilus picturatus, McLach. Krisuvik, 4 ♂, 1 ♀, Hengill Mountain, 1100 ft., 1 ♀.

The species was founded by me (Revis. and Synop., p. 78) on the ♀ only, from northern Europe. Subsequently the ♂, from Iceland (*Staudinger*), was described by me as *L. exulans* (Suppl., p. vi). Eventually it was found that both were the sexes of one species (Suppl., p. xxi), which has a wide range from Iceland over northern Europe and Asia to the eastern Amur. Only one (that from Hengill) of the Icelandic examples now before me in any way resembles the highly-marked form of the ♀ from which *picturatus* was first described.

Limnophilus affinis, Curtis. Reykjavik, 3 ♂, 3 ♀.

The Icelandic examples quite resemble the common English form of this wide-spread species.

Limnophilus griseus, L. Reykjavik, Krisuvik, and Hengill, 77 examples in both sexes.

This is evidently the common Trichopteron of Iceland. The long series naturally shows extreme variability both in size and colour. The small common English pale form of the ♂ occurs in both sexes, chiefly from Hengill and Krisuvik; in these the wings have scarcely any markings, except the dark pterostigma. A larger pale form is represented in quantity from Reykjavik, together with some specimens approaching the highly-variegated form of the ♀ (rarely of ♂) common

with us. Many examples of a highly melanic form are also from Reykjavik. In these the anterior-wings are nearly suffused with blackish-fuscous, and almost without markings, reminding one of some small high-alpine forms of *bipunctatus*, or a not uncommon form of *sparsus*. All gradations between the pale and dark, and the large and small, occur.

Apatania arctica, Boh. Reykjavik, 3 ♀.

Truly an inhabitant of the boreal and arctic islands and probably mainland, and which must be usually, if not entirely, parthenogenetic. The Icelandic examples appear identical with others from Spitzbergen (the typical locality); naturally there is danger in determining insects of this genus of which only the ♀ is known, and especially from dry specimens.

All the above, with the exception of *A. arctica*, have been previously recorded from Iceland. So also have *Limnophilus elegans*, Curt., taken by Gaimard, and now in the Museum of the Jardin des Plantes at Paris (*cf.* Revis. and Synop., Suppl., p. xviii); and *L. miser*, McLach. (*l. c.*, p. vii).

On the other hand, two species have been incorrectly recorded from the island, viz.: *L. bipunctatus*, Curt. (Revis. and Synop., p. 88), the locality proving to be erroneous (Suppl., p. vii), and *L. trimaculatus*, Zett. (*cf.* Hagen, Neurop. N. Amer., p. 262), which proved to be *L. miser*, McLach.

Staudinger, in the account of his journey in Iceland (Stett. Zeit., 1857), mentions having taken seven species of *Trichoptera* [also *Hemerobius nervosus*, F. (determined by Stein), and a *Capnia*]. Some much earlier records are too vague to be of importance.

The following species have been recorded from the Färöe Islands, which lie nearly half-way between Unst in Shetland and Iceland, viz.: *Limnophilus griseus*, L., *L. sparsus*, Curt., *Plectrocnemia conspersa*, Curt., and *Rhyacophila dorsalis*, Curt. The last two frequent streams. It is somewhat singular that all those recorded from Iceland may be presumed to inhabit standing water in the larval stage, the *Apatania* possibly excepted; but Mr. Mason suggests a possible reason for the apparent absence of torrentine species, viz., the fact that the streams are, almost without exception, fed by glacier water.

Lewisham, London :

September 21st, 1889.

SECOND SUPPLEMENT TO ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

(Continued from p. 396).

H. DUBIA, Mde.

Since I described this species as new in the first part of my list, I have found that it has been previously discovered by Professor Mik, of Vienna, and named *H. Goberti*; my name must, therefore, sink into a synonym.

MYDÆA, R. Desv.

M. ALLOTALLA, Meig.

Some years ago Mr. Verrall sent me two specimens of this rare fly, captured at Lee, Kent, which were the only ones I had seen, until Dr. Schnabl gave me another lately of the same species, which he designated *S. bisignata*, Zett. Mr. Verrall's specimens, as well as Dr. Schnabl's, have the abdomen marked with two small, indistinct, triangular spots placed near each other on the second segment, and with two other very faint ones on the third segment, while Meigen says that his *M. allotalla* was unspotted. As my specimens agree very closely with Zetterstedt's description of *S. bisignata*,* I am inclined to think, with Dr. Schnabl, that they are the same, but as *M. impuncta* often has the abdomen spotted, when it becomes the *S. demigrans*, Zett.; so I think it highly probable that the former species may likewise often have the abdomen immaculate, when it will agree with Meigen's description of *M. allotalla*, showing that *M. allotalla*, Meig., and *S. bisignata*, Zett., are only varieties of the same species.

M. NIGRICOLA, Fall.

This species is rare. I had only seen one British specimen when I published my list, whose habitat was unknown to me; in July 1887 however, I captured a well-marked example at Baslow, Derbyshire. This little fly closely resembles *M. vespertina*, Fall., in form and colour, but differs by having yellow legs, the fore femora and tarsi only being black.

M. SEPARATA, Meig.

A few months ago Miss R. Prescott-Decie sent me a Dipteron which seemed to differ from the ordinary specimens of *M. separata*, and I named it *M. grandæva*, Zett. Dr. Schnabl, of Warsaw, also lately forwarded to me both males and females of a fly which he also so labelled. All these specimens closely resembled those of *M. separata*, only differing by having the fore femora more or less blackened at the base. Zetterstedt, in his description of the female of *M. grandæva* (he did not know the male), says the forehead is rather prominent, the basal halves of the fore femora are black, the external transverse veins of the wings are straight, the arista pubescent, &c.

The specimens which I had received as *M. grandæva* agreed with those which I possess of *M. separata* in all points except in the colour of the fore femora, and on looking over my examples of the latter species (of which I have a good many

* The abdomen being spotted, it becomes a *Spilogaster*.

specimens) I find several which have the bases of these parts more or less blackened ; so I have arrived at the conclusion that *M. separata*, Meig., and *M. grandæva*, Zett., are the same.*

SPILOGASTER, Macq.

S. QUADRIMACULATA, Fall.

In my list I followed the example of Rondani, and named this species *quatuor-maculata* ; it is more correctly designated *quadrимaculata* by Fallén.

S. ATRIPES, sp. n.

As I stated in the first part of my list, the *S. duplicata*, Meig., must be looked upon as the representative of a group of several closely allied species, or perhaps only varieties ; which are very difficult to define or discriminate from each other. In June last I captured at Hornsea, near Hull, two males of a species which though nearly allied to the one which I have described as the true *S. duplicata* of Meigen,† is decidedly different, and is also distinct from *S. duplaris*, Zett., as well as from *S. communis*, Desv. From its black legs I shall call it *S. atripes*.

♂. *Nigro-cinerea, oculis subcontiguous ; arista longe-plumata, thorace antice albo-cinereo quadristriato setis dorso-centralibus tribus pone-suturam ; abdomine quadrimaculato, segmentis subanalibus prominentibus ; pedibus prorsus nigris.*

Long., 7 ad 8 mm.

Head : eyes subcontiguous ; arista long haired. *Thorax* clear ashy-grey, with front margin almost white ; marked with four very distinct shining black stripes, the middle pair straight, extending from the front edge to a little behind the transverse suture, the lateral ones maculiform, shortened in front and extending backwards nearly to the scutellum ; dorso-central bristles five in number, two before and three behind the suture. *Scutellum* clear grey and immaculate.

Abdomen cylindrico-conical, with four small black spots, two on the second and two on the third segment ; subanal segments large, and furnished with a prominent process, which projects forwards and ends in a hairy tuft near the middle of the venter. *Legs* quite black, armed as in *S. duplicata*.

Wings clear, transverse veins unclouded, external one oblique and slightly sinuous, costal spine large. *Alulets* white. *Halteres* yellow.

This species differs from all the others in the group by having only three dorso-central thoracic bristles behind the transverse suture ; *S. duplicata*, *S. duplaris*, and *S. communis* having four ; the form and size of the subanal male processes are also different, they being larger and more prominent in *S. atripes* than in either of the other three species, which all have them very similarly developed ; lastly, this species has the legs quite black, whereas, in each of the others, the knees, and often the hind tibiæ, are somewhat rufous, even in the males.

I could not find a female.

S. FRATERCULA, Zett.

This species is nearly allied to *S. pertusa*, Meig., in size, colour, &c., but differs by having the arista less pubescent (it is nearly bare towards the apex), and the legs darker in colour. In *S. pertusa* the fore femora and tarsi only are black, and the hinder femora and all the tibiæ are flavescent ; while in *S. fratercula*, besides the

* *M. separata* of Schiner is a distinct species, which has the arista plumose.

† The *Mydna nigripes* of R. Desvoidy is considered to be synonymous with *S. duplicata*, Meig.

fore femora, the basal halves of the four hinder ones are black as well as the tarsi; while the extremities of the posterior femora and the tibiæ are rufous or testaceous instead of yellow.

I found a single male of this species at Baslow, in Derbyshire, in July, 1887.

S. SPINIFEMORATA, sp. n.

♂. *Nigro-cinerea, fronte non-prominenti; oculis subcontiguus; arista subplumata; antennis palpisque nigris; thorace lineis quatuor nigris striato; pedibus nigris, geniculis tibiisque ruficentibus; femoribus spinolosis; tibiis posticis pilosis.*

Long., 6 mm.

Head: forehead and epistome unprojecting; eyes subcontiguous; frontal space black; antennæ and palpi black; the former with the style subplumose, the hairs being longer on the upper than the under-side. *Thorax* covered with grey tomentum, having four longitudinal black stripes, the outer ones straight (like the middle pair) in front, but merging behind into irregular oblong black patches; sides marked with sinuous whitish lines, which extend to the bases of the wings; medio-central dorsal bristles four in number, behind the suture. *Scutellum* grey.

Abdomen cinereous, hairy, conico-cylindrical, with six triangular black spots, two very small upon the first segment, and two larger ones on the second and third segments; anal segments with two moderate sized bilobed, flattened, subanal processes.

Wings tinged with yellowish-brown at the base and along the upper half; veins all stained with brown; both transverse veins clouded; third and fourth longitudinal veins diverging somewhat from each other towards the apex, which lies almost in the centre between their extremities; transverse veins rather near together; external one straight, but rather oblique. *Calyptra* yellowish-brown, fringed with a yellow margin. *Halteres* pale yellow.

Legs, with coxæ and tarsi, black; fore femora black, except at the apex, which is red; middle and hind femora with their basal two-thirds black, and the ends, together with the tibiæ, rufous; fore tibiæ piceous. All the femora are furnished beneath with a row of long and strong spines, which are arranged in two rows under the hind ones. The fore tibiæ have a single spine before the apex; the middle tibiæ have two bristles on the outer side a little beyond the middle; the hind tibiæ are very hairy, having a number of long and strong hairs of nearly equal lengths along the whole outer surface, as well as numerous soft and shorter ones on their inner sides.

I received a single male of this well-marked species from Miss Prescott-Decie, which she captured at Bontddu, North Wales, August 21st, 1888. It bears considerable resemblance to *S. fratercula*, Zett., but differs essentially by having spinose femora and hairy hind tibiæ.

S. ANCEPS, Zett.

Dr. Schnabl lately sent me some specimens similar to those of *S. communis*, Desv., labelled *S. anceps*, Zett., and told me that, in his opinion, *S. anceps*, Zett., *S. communis*, Desv., and *S. casia*, Macq., were the same. Zetterstedt's description of *S. anceps* will apply very well to the females of *S. communis*, but the males of the latter species are generally much more nigrescent than he represents those of *S. anceps* to be, so, in my opinion, the name *anceps* should be rather considered synonymous with *S. quadrum*, F., than with *S. communis*, Desv.

(To be continued).

A NEW SPECIES OF *ANTHOCORIS*.

BY J. W. DOUGLAS, F.E.S.

ANTHOCORIS VISCI.

Narrow, sides beyond the thorax straight, parallel; upper surface (the head on the under-side also) fulvo-testaceous, clothed with delicate, very short, yellowish pubescence; antennæ and legs concolorous. Head, pronotum, scutellum, cuneus, and membrane very glossy. Antennæ slender; 1st joint shortest, reaching scarcely beyond the apex of the head, unicolorous; 2nd more than twice as long, apex black; 3rd and 4th each longer than the 1st, sub-equal, entirely, or only gradually up the apex, black. Eyes black. Rostrum black, not reaching to the prosternum. Pronotum transverse, trapezoidal, sides straight, not constricted, nor curved out; posterior margin widely emarginate; surface with a deep transverse sulcation beyond the middle, posterior to this the colour is black or fuscous. Scutellum black, with a posterior deep sulcate deflexion. Elytra:—clavus with a black spot at the apex; corium dull, posteriorly a large, subtriangular, black spot, not extending to the embolium, sometimes separated into two by a pale streak; cuneus black, distinctly punctured, the margin testaceous, the basal suture marked with a more or less yellowish line; membrane black, iridescent, with three large white spots, one of them at the base, undefined, the two others clearly defined, large, subreniform, clear, diaphanous, one of them below the cuneus, the other beyond the middle of the inner margin. Under-side glossy, black, the prosternum anteriorly (sometimes almost wholly) fulvo-testaceous; the abdomen at the end (sometimes almost entirely) rufous. ♂, ♀.

Length, 3 mm.

On October 4th, Dr. Chapman sent me a few specimens which he had just previously taken exclusively from mistletoe (*Viscum album*) at Hereford; amongst them were two pupæ, showing that the brood had been reared on the mistletoe, where, like congeneric species on other plants, they had doubtless lived on *Aphides*, in this case on some special to the plant. These examples at once arrested attention by their uniform small size, light colour, and lustre, and as I could not identify them exactly with any species, I concluded to describe them as new, under the name of *A. visci*. But as I did not possess some of the described species, I determined first to refer to Dr. A. Puton's superior knowledge, and ask his opinion of the species, which he has kindly given, as follows, and which I think is conclusive:—

"I send you two *Anthocoris Minki*, from Bohemia; one of them (red) is the type, the other (brown) is the var. *simulans*, Reut. These examples should be properly named, for they have been seen by Reuter, the author of the 'Monographia Anthocoridarum.' *A. visci* is certainly different from it by its smaller size, the pronotum straighter at the sides, and the corium entirely opaque. This last character separates it from *A. sarothamni*, which is about the same size. By the opaque corium it approaches much more to *A. confusus*, Reut., but *visci*, although

shorter, is proportionally broader, the colour also is very different, for only very brown examples of *confusus* are known. The examples of *A. visci* that you have sent me are not immature, for the eyes are black."

8, Beaufort Gardens, Lewisham :

October 11th, 1889.

DESCRIPTION OF THE LARVÆ OF TWO SPECIES OF *ISMENE* FROM EASTERN AFRICA.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S., &c.

ISMENE *ANCHISES*, Gerst.

Length, $1\frac{1}{2}$ inch. Velvety-black ; a narrow, white transverse line on anterior part of each segment ; fifth to twelfth segments with two narrow, transverse, orange lines, divided by a broad and intensely black band, having the appearance of a series of rings ; a subdorsal row of linear shaped white spots, and a spiracular row of round white spots ; under-surface, legs and claspers bright claret colour.

Head cordate, bright brick-red, with seven conspicuous black spots ; ocelli black.

Feeds in rolled-up leaves of a species of *Citrus*, wherein, when full grown, it spins a loose network cocoon and changes to a dark brown pupa, covered with a whitish powdery bloom.

Hab. : Wassin and Zanzibar.

ISMENE *FORESTAN*, Cram.

Length, $1\frac{1}{4}$ inch. Pale greenish-yellow, with minute darker rings, and a broad purple band upon each segment as far as spiracular skinfold, which is conspicuous and yellow ; a linear shaped subdorsal spot in each purple band, and a subdorsal orange blotch upon the twelfth and thirteenth segments ; under-surface paler.

Head pale red, three round black spots above the mouth, four large linear shaped black spots on forehead, and two on cheeks, the upper one of which is very small.

Feeds upon a small papilionaceous shrub, drawing the terminal shoots together, and wherein, when full grown, it changes to a pale reddish-brown pupa covered with a whitish powdery bloom.

Hab. : Wassin and Zanzibar.

The above larvæ are very handsome. The butterflies appeared in about fourteen days. Both species were tolerably common while I was at Zanzibar from March to June, 1889. They fly very rapidly with a jerky flight in the hottest sunshine, as well as just before sunset. There appears to be a succession of broods, as I found larvæ of all sizes at the same time as the perfect insect was on the wing.

September, 1889.

Forficula pubescens, Géné.—Yesterday I took five specimens of this local species at Weymouth, where it was discovered by my father in September, 1837. We have also found it at Charmouth in Dorsetshire, and at Bonchurch in the Isle of Wight. It hibernates in the stems of the common reed. My father also took one at Glanvilles Wootton, in November, 1860, and Mr. Curtis one near Salisbury, in May, 1842.—C. W. DALE, Manor House, Glanvilles Wootton, Sherborne : *September 24th*, 1889.

Stenobothrus rufipes, Zett.—I see, from Mr. Eland Shaw's paper, that this species is decidedly local. It may be well, therefore, to put on record that it occurs here at Guestling rather commonly near the Rectory, and probably elsewhere, as I have paid scarcely any attention to the *Orthoptera*.—E. N. BLOOMFIELD, Guestling : *October 12th*, 1889.

Vanessa Antiopa at Guestling.—I was greatly pleased and surprised at the appearance of this insect in my garden on Tuesday, September 10th. It settled within a couple of yards of me, and we watched it for some minutes, when, on its opening its wings, I saw that the borders were of a cream or light buff colour. I then procured my net and captured it without difficulty. It is a small specimen, but in very good condition, and worthy of record, not only on account of the rarity of the species, but of the colour of the borders of the wings, which shows it had not been long on the wing. It must, indeed, have just emerged from the pupa, for after capture it discharged a red fluid as is usual with newly-disclosed *Vanessidæ*. I believe another specimen was taken about the same time at Ecclesbourne, and two have been met with near Battle. A notice of the capture of this species at Beckley in April last is given in the "Entomologist," so that in this neighbourhood we have been specially favoured by visits of *V. Antiopa*.—ID.

Vanessa Antiopa at Beckenham.—A specimen of the above, in good condition, was caught in the garden of a friend of mine at Beckenham about the end of last month.—EDWARD SAUNDERS, St. Ann's, Woking : *October 15th*, 1889.

Vanessa Antiopa at Barcombe, Sussex.—In a letter which I recently received from Mr. Salmon, of Barcombe, the writer informs me that a specimen of *Vanessa Antiopa* was caught in the garden of Barcombe Rectory on the 7th September last.—H. Goss, Surbiton : *October 8th*, 1889.

Dates of appearance of Lycana Artaxerxes.—This year, on June 19th, I took four beautiful freshly emerged specimens of *Lycana Artaxerxes*, being the earliest record I have noticed of its appearance in this locality, which is the nearest to the English border I think of any yet recorded. Last year I did not see it till July 20th, and in 1887 I saw it for the first time on the 9th of that month.—A. ELLIOT, Caverton, Roxburgh, N.B. : *June 25th*, 1889.

Lycana exilis.—In the Proceedings of the Royal Society of Queensland, Vol. vi, pt. 4, 1889, p. 159, figs. 13, 14, 15 (? unnumbered), Mr. Thomas P. Lucas, M.R.C.S., etc., describes a new species of butterfly as *Lycana exilis*. I write to call attention

at once to the fact that Boisduval in the *Annales de la Société Entomologique de France*, 2d Series, vol. x, p. 294, 1852, has already used that name for a thoroughly good and well-known species found in the United States from Florida to California.—E. M. AARON, Philadelphia: *September 11th*, 1889.

Description of the larva of Sericoris fuligana, Haw., Stn., abscisana, Dbld.—I met with this larva quite accidentally last autumn. *Eupœcilia dubitana* had appeared plentifully on some rough ground near the river, and it appeared to frequent (probably for shelter) the common creeping-rooted thistle, which, of course, abounded there. As no known food-plant of *dubitana* grew upon the ground, I searched the thistle-heads for its larva, but without success. I found, however, that a very different larva was mining and drawing together the young shoots, and this proved to be the long looked for larva of *Sericoris fuligana*.

This larva was, at that time—the end of September—rather sluggish, living in the side shoots of this thistle (*Carduus arvensis*), drawing together the young leaves, eating out the pith and the heart of the shoot, and passing readily to a fresh shoot at will. It is cylindrical, slender, wrinkled, especially towards the head, dull bluish-green, with slightly shining raised dots, and very minute hairs, head shining olive-brown, plates and feet similar, but paler, prolegs bluish-green. When full-fed they left the shoots to spin up among dry rubbish, gauze and paper being willingly used. Probably, they did not assume the pupa state until the spring, as very few emerged; these came out in May.

In June, larvæ were again feeding in the thistle shoots, but were very much more active, and moved constantly from shoot to shoot. There seemed to be a succession of larvæ through the month, and the moths emerged from time to time through July. The pupa is pretty; pale brown, with green wing cases, in a neat tight cocoon.

At liberty the moth seems very sluggish. I could only find it on the wing on one evening after sunset, and very sparingly. It appears to be extremely local.—CHAS. G. BARRETT, Norfolk Street, King's Lynn: *September 13th*, 1889.

New food-plant for Eupœcilia dubitana, Hb.—A renewed search for the larva of this species was more successful. It was found feeding in the flower heads of *Crepis tectorum*. The fat larva nearly filled the head, but the only external indication of its presence was a very slight starting of the pappus. It is not active, very plump, glossy, with delicate hairs; whitish until full-fed, then tinged with pink. Head pale chestnut, plates both honey-yellow, the dorsal being divided and edged behind with black; spots, legs, and prolegs of the colour of the body. When quite young its whitish colour is tinged with grey, the dorsal vessel is darker, and dorsal plate blacker. It eats out the seeds, doubtless emptying several heads, and leaves them when full-fed to pupate among rubbish. The pupa is light brown. There are two broods in the year: moths in June and August, larvæ in July and September.

The present is the seventh species of plant upon which this larva has been found, and, like several others, is extremely abundant; yet the insect is excessively local in its distribution, abounding in certain restricted localities.—ID.

Re-occurrence of Oxyptilus pilosellæ in England, with notes on its nearest allies.—Some doubts have recently been expressed, elsewhere, as to the accuracy of the records of former captures of *Oxyptilus pilosellæ* and *O. hieracii* in this country. Special interest, therefore, attaches to the re-discovery of the former species this year. My old friend, Mr. Sidney Webb, has forwarded specimens taken by himself near Dover, which agree most accurately, not only with older British specimens in my collection, but with German examples sent me long ago by the late Professor Zeller. That these Dover specimens are genuine *pilosellæ* does not, I think, admit of the smallest doubt.

Perhaps a few words on the distinctions between our species in this closely allied group may not be out of place.

In *pilosellæ*, the costal margin is much arched beyond the middle, so that the apex is long, pointed, and drooping. The two pale fasciæ (which, in all these species, cross the divisions of the fore-wings) are in *pilosellæ* yellowish-white, oblique, not very narrow nor well defined. The third feather (division) of the hind-wing has a large dark brown tuft of scales near the tip.

Hieracii is of the same size, but with the costal margin less arched, and the apex more blunt and squared; the fasciæ are more perpendicular, narrower, and more sharply defined. The tuft on the third feather of the hind-wing is brown, and is situated *just beyond the middle*.

Parvidactylus is considerably smaller, of the colour of *pilosellæ*, and with oblique fasciæ, but these are narrow, bright, and sharply defined; the costal margin is much less arched, and the tips less produced, though hardly so blunt as in *hieracii*. The dark tuft on the third feather of hind-wing is large, and placed nearly at the tip.

Distans is of a paler duller colour than the three foregoing, and its pale fasciæ are so placed as to resemble crescents, especially when the insect is alive and at rest. Its shape and size are similar to those of *hieracii*, and the tuft on third feather of hind-wings is similarly placed, though small and inconspicuous, but the species is at once distinguished by its broad, ill-defined, pale fasciæ. *Lætus* appears to be a paler form of this species.

Heterodactylus, Hw. (*teucarii*, Greening), which was at one time mistaken for *hieracii*, is, perhaps, the largest of the group, at any rate, its wings are decidedly broader, and from its dark colour and bright white markings, it is by far the most handsome. Its costal margin is much rounded, tips long and drooping, fasciæ fairly broad and brightly defined, and the inner (dorsal) margin of the fore-wings is edged with bright white cilia, in which are three black dashes. The third feather of the hind-wing has a large blackish tuft, and the anterior portion of the feather is white, with numerous black dots.

Several more species are recognised on the continent, and some of them—*ericetorum* and *didactylus*, for instance—are very pretty. In all, the distinctions appear slight but constant.—ID.: September 17th, 1889.

Crambus myellus.—This year I again had the pleasure, with Mr. Herd, of having a day in search of this species, and one of the incidents of the day I think worthy of record. We had searched the old haunt of the species, treading almost over each spot so well remembered by the capture of specimens in former years, but

all to no purpose ; feeling rather disappointed, we decided to push on our way to where we thought we had once seen ground that looked favourable. The day was well advanced, but it was our only hope of success. I was, therefore, very glad soon after arrival to be able to announce the first capture, a very fine example, and while carefully boxing my specimen, Mr. Herd shouted he had two in his net at the same time. Having helped him to secure his prizes, we started off again, but a moment had hardly elapsed when he again called for my assistance to secure one which had taken refuge from his net in one of the inside pockets of his coat amongst his empty boxes, and it required no little care to extract it without injury. We had thus secured four specimens in less than that number of minutes, and soon forgot our former discouragement. One of the specimens was a little rubbed, and had evidently been out for some time, but the other three were very fine, and no doubt recently emerged, in fact, we concluded we were near "where a family of larvæ must have fed."—S. T. ELLISON, Perth : *October 10th*, 1889.

Notes on Peltastica Reitteri, Lewis, and Rhysodes exaratus, Serv., and on Byrrhus fasciatus, L., and B. kamtschaticus, Mots.—In Vol. xx of this Magazine, p. 79 (1883), I noted the differences between *Peltastica Reitteri* from Japan and the Siberian *amurensis*, Reitter, but at that time I had not seen a specimen of the American *tuberculata*, Mannerheim. Dr. Sharp has now lent me four examples of the last, and I am able to indicate some of the more important specific differences between the two insects. The antennæ are distinctly shorter in *Reitteri*, and this shortness is particularly noticeable in the third joint and the three terminal ones which form the club ; the head is smaller and darker in colour, generally black, distinctly more clearly punctured, the space before the clypeus more visibly raised, and the sinuosities in the upper part of the eye-rim (well marked in *tuberculata*) are obsolete ; the thorax has the anterior angles less produced, and the elytra are relatively broader and shorter. There are differences also in the arrangement of the tubercles on the elytra, which are difficult to indicate, as they vary in the individuals of both kinds, but there is a uniformity of variation in each species.

I have written this, because Dr. John Hamilton has introduced the name of *tuberculata* into his Catalogue of Insects common to North America, Northern Asia and Europe, on the assumption that *Reitteri* from Japan is the same species. *Peltastica tuberculata* is not the same species, and therefore it should not be in his list. Dr. John Hamilton (p. 134) appears to have inserted it on the strength of a letter written to him by Dr. Horn, the latter saying "Having compared specimens sent to me by Mr. Lewis with a series in my cabinet of our species, they seem scarcely more than a variety." Dr. Horn's sentence is somewhat ambiguous, but I understand it to mean that Dr. Horn thinks there are two species, but, at the same time, he has not closely examined them.

I see also that *Rhysodes exaratus*, Serv., is given as American in the same Catalogue. The differences between *Rhysodes americanus*, Lap., and *exaratus*, Serv., are considerable, but I do not think any sketch of the comparative characters of the two species has ever been published. I gave what I believe to be the correct synonymy in the Ann. Mag. Nat. Hist. in 1888, p. 84 ; this was after seeing (as I stated, p. 80) the type specimen described by Professor Westwood in 1835, and comparing it with examples from Michigan, and specimens of *exaratus*, Serv., from the east of Europe and France.

The chief differences between the two insects may be summed up as follows :— in the European species the head is more transverse, and the lateral angle between the cephalic lobe and the rostrum is evident ; but in the American species the head is more rounded both before and behind. The humeral angles in *exaratus*, Serv., are much more prominent and project at a different angle to those of *americanus*, and the angles in the first are distinctly reflexed. The elytral punctures which constitute the striae are deeper, and the interstices are not flat, as in *americanus*. The sexual differences in the hind tibiae are very marked, those in the American species being much more simply fashioned. I think, also, the antennæ are longer in *exaratus*, all the joints seem to me to be freer ; and there are still other differences, such as the shape of the thorax, &c., which are constant, though not conspicuous.

Mons. Albert Fauvel's "Liste de Coléoptères communs à l'Europe et à l'Amérique du Nord," just published, and kindly sent to me by the author, also contains the name of the American species as a synonym of *exaratus*, Serv.

It seems to me that since the year 1835 (more than 50 years ago), when Westwood published the description of *exaratus* (not observing that the name was employed by Serville in 1825), American and European Entomologists have been so busy in studying their own faunas, that each, possessing a species of *Rhysodes* from their own area and thinking the species on both sides of the Atlantic the same, it has never happened that the two species have been side by side in any collection which has been carefully scrutinized.

Again, a third species in Dr. Hamilton's list is wrongly inserted, viz., *Byrrhus fasciatus*, Linn., because *Byrrhus kamtschaticus*, Motsch., is not a variety of it. Motschulsky compares the latter to *fasciatus*, but he says it is the size of *pilula*, Linn. I have taken *kamtschaticus* on very high altitudes in Central Japan, also in South Yezo, and I now record it from Japan for the first time ; the largest specimen measures just over 4 lines, it measures 9 mm. ; the smallest specimen 7 mm., or the equivalent of Motschulsky's measurement $3\frac{1}{2}$ lines. The head is much larger than that of *fasciatus* in proportion to its size, and the forehead is rough, uneven, and a little convex. *B. fasciatus* is almost flat between the eyes, &c. The elytral band or fascia in *kamtschaticus* is widened out in the middle, and Motschulsky's figure, bad as it is, roughly represents the pattern, but the band in *fasciatus* is narrow. There are other species in Dr. Hamilton's Catalogue which I shall refer to later if my Japanese material ever gets worked out.

In 1874 (Ent. Mo. Mag., x, 173) I attempted to draw out a list of species "Common to Europe and Japan," but beyond the species, such as *Corynetes rufipes*, *Trogosita mauritanica*, *Carcinops pumilio*, &c., species which are in all the Catalogues and interest nobody, the list requires, small as it is, considerable revision. If I ever try to compose a similar list I shall only include species I have myself examined and identified, as I think any other system of working is likely to be without the proper verification of the species, and therefore more likely to be misleading than useful.—G. LEWIS, 1, Queen's Ride, Barnes : September 27th, 1889.

Parasites of Limacodes testudo.—Mr. W. H. B. Fletcher has bred from this host both sexes of the rare Ichneumon *Sphinctus serotinus*, these issued toward the end of September ; in the middle of July, 1887, he also bred a fine female of *Pelecystoma lutea*. When the Rev. T. A. Marshall published his monograph of the

British *Braconidæ*, he knew of but two British specimens, one of the two was bred from the above host, and the other from an uncertain one. Ratzeburg, in "Die Ichn. Forst.," records these two Ichneumons bred from *L. testudo*, probably one of the two is hyperparasitic. Brischke records having taken *Sphinctus serotinus* as late as October 6th.—JOHN B. BRIDGMAN, Norwich: September, 1889.

Agriotypus major, Siebold.—When writing my paper on *Agriotypus armatus* (ante p. 339), I felt sure that, sooner or later, I would find agriotypized cases of *Odontocerum albicorne*, Scop., mentioned by Siebold (Stett., Ent. Zeit., 1861, p. 60), and I was happy to detect, last month, in the rich locality Hrádek, amongst hundreds of agriotypized cases of *Silo nigricornis*, one of the *Odontocerum*, bearing the well known appendage. The appendage was comparatively short, 10 mm. long and 1 mm. in diameter, stiff and strong, arising from the left side of the mouth opening. The inner cocoon was 10 mm. long, leaving a very large space in the hinder part of the case, in which were the remains of the devoured larva. The cocoon enclosed a fully developed *Agriotypus* ♀. Siebold says he could find no differences between the nymph of *A. armatus* and *major*, except in size. The same is true with respect to the imago. I have measured examples from *Silo* in comparison with that from *Odontocerum*, and found the length of body of the former to vary from 5.62 to 6.28 mm., and the length of the fore-wings from 4 to 4.43 mm. The length of *A. major* (from *Odontocerum*) was 9 mm., and the length of fore-wings 6 mm. It agrees in respect of size with the typical examples of *A. armatus* described by Curtis, but is nearly twice the size of those ordinarily found at Hrádek. The number of joints in the antennæ appears to be greater in the larger form.

As in September of this year I found many agriotypized cases of *Silo* containing not only nymphs, but also developed imagos of the parasite (and occasionally sub-nymphs), it is therefore possible that it is on the wing also in late autumn; but, owing to the unfavourable weather, I could not find it.—FRANZ KLAPÁLEK, Prague: October 2nd, 1889.

Rare Aculeate Hymenoptera in 1889.—I have been devoting, throughout the present year, such time as I could spare from engagements of a very different kind, to collecting specimens of the Aculeate *Hymenoptera*, principally in the neighbourhood of Rugby, but also in other localities, in which, from time to time, I have happened to be paying visits. With the proverbial luck of beginners, I have made some captures which Mr. E. Saunders (after most kindly examining them all, and verifying or correcting my attempted identifications) considers worthy of record; and I send the following notes at his suggestion.

Halictus atricornis.—Of this species (known hitherto, as far as I have been able to learn, only by specimens taken long ago in Cheshire by the late Mr. B. Cooke, and a single ♂ at Wotton, Gloucester, by Mr. R. C. L. Perkins in 1887, Ent. Mo. Mag., xxiv, p. 91) I have taken both sexes (the males in considerable numbers) in several places within a mile or so of Rugby. And, strange to say, happening in August to visit the village of Whalley, in Lancashire, I took both sexes there also in a sandpit. In Rugby, on May 21st and 22nd, I found *atricornis* ♀ entering and issuing from burrows in the side of a ditch by the high road, and (apparently infesting these burrows) I caught on both days females of *Nomada Fabriciana*. At or close to the same spot I obtained also one female of *Sphecodes ferruginatus*.

Bombus Scrimshiranus.—I took a male on September 25th in the garden of a friend's house at Wimbledon. *B. pomorum*.—On September 9th I secured a female of this extremely rare species at Beachy Head, just under the lighthouse. (Mr. Saunders says, in his Synopsis, 1884, "The ♂ and ♀ only have occurred in this country, and we have only one locality recorded, viz., near Deal, where Mr. F. Smith captured three males in 1863, and his son a female in 1864.")

On the 14th and 15th of August I was visiting Mr. Saunders at Woking, and went out on each day collecting in the immediate neighbourhood. On the 14th I brought back a specimen of *Hoplisis bicinctus*, and on the 15th, one of *Priocnemis affinis*; both rare insects, and not previously found at Woking, though the district has been exceptionally well searched for Aculeates.—F. D. MORICE, Rugby: Oct., 1889.

Parnus nitidulus, Heer, in Devonshire.—On p. 325 of the present volume, I mentioned the occurrence of a *Parnus* on the sand-hills at Braunton Burrows. I then thought the two specimens taken were somewhat aberrant examples of *P. auriculatus*; but recently, having been able to examine them more thoroughly, I find them to be *P. nitidulus*, Heer, a species hitherto unique in Great Britain. Dr. Sharp, who took the first specimen on the golf-links at Aberlady, has kindly examined them, and confirms my diagnosis.

My specimens have lost the golden pubescence, and this gives them an additional resemblance to *P. auriculatus*, from which they can, however, be distinguished by the smaller and slenderer shape, and the absence of striæ at the base of the elytra.

It is a singular coincidence that Dr. Sharp's specimens and mine have both been taken on sand-hills. I only took a pair, which were on the flatter and less barren part of the Burrows farthest from the coast.—W. F. H. BLANDFORD, 48, Wimpole Street, W.: October 14th, 1889.

Aberrant specimen of Notoxus monoceros, L.—I have just received from Mr. George Henry, of Hastings, a specimen of *Notoxus monoceros*, L., with the thoracic horn deeply and strongly bifurcated. I have never noticed this peculiarity before in this species, but it is quite possible that similar examples may be found in our collections. Mr. Henry's insect was taken on the Camber sand-hills off Rye, in 1880.—W. W. FOWLER, Lincoln: October 17th, 1889.

Acocephalus nervosus, Schrank.—In the garden is a patch of tansy (*Tanacetum vulgare*) of some years' growth, cultivated for the sake of its ornamental foliage; it is now about six feet in diameter, and contains some 300 stems. On the 10th inst. I saw, on the top of one of the stems among the leaves, several individuals of *Acocephalus nervosus*, and was surprised to find, on further search, that each stem had on it, in a similar manner, on an average five *Acocephali*, ♂, ♀, a few of them still in the pupa state. Thus there were at least 1500 of them in this one spot, a number that I never saw of any species of *Homoptera* within the same limits. There they sat quite still under their verdant canopies as in paradisiacal enjoyment of a state of rapture. Some being in the pupa stage showed that all had been reared on the plants. At this season the flowers of the tansy are usually abundant, but now there are scarcely any, and I attribute the paucity to the absorption of the sap of the plants by the enormous number of abstracters. They have concentrated their attention to the tansy,

for there are none of them on any other plants in the garden; and though I have often taken them elsewhere on several sorts of plants, I have never been able to identify any one in particular as affording primary nourishment to the *Acocephalus* as in this case.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: *August 12th*, 1889.

The male of Chionaspis fraxini, Sign. (*Ch. salicis*, Linn.).—This year, during the last week of July and the first week of August, I bred quantities of males of *Chionaspis fraxini* from growing branches of ash. I kept a large infested branch in my office for a fortnight, and so had an excellent opportunity of watching their development; their mode of pairing was certainly one of the most fortuitous proceedings that I ever witnessed. The respiratory system is very easily to be traced if a suitable specimen be selected. There are both apterous and winged forms; both appear at the same time and in about equal numbers. The first half-dozen specimens that hatched out were apterous; not knowing that there would be others with wings they puzzled me very much, and when the winged forms came out I was still more astonished. I carefully examined them all and found the antennæ and legs to be exactly the same in both forms, and they must be of the same species, as no other kind of scale was present upon the branches. When mounted in Canada balsam or glycerine they became so contorted as to be useless for reference; the only agent in which I could examine them properly was water, but of course they decayed in an hour or so. I tried almost every agent I could get, but none was so efficient as water; in this you are able to see the articulations of the legs beautifully.—ROBERT NEWSTEAD, Grosvenor Museum, Chester: *September 18th*, 1889.

[The observation of apterous and winged males proceeding simultaneously from the same batch of scales is of interest. Bouché and Ratzeburg state that they are apterous; Signoret had always found them winged, the difference he adds depending, perhaps, upon the localities, which does not appear to be the case.—J. W. D.]

BIRMINGHAM ENTOMOLOGICAL SOCIETY: *Sept. 16th*, 1889.—R. C. BRADLEY, Esq., in the Chair.

Mr. E. C. Tye showed a long series of *Hypsipetes sordidata*, showing considerable variation; also series of *Phycis fusca* and *Harpella Geoffrella*. Mr. Neville Chamberlain showed a *Pterophorus* taken in Ross-shire which he had not been able to identify. Mr. Martineau showed a nest of *Vespa sylvestris*. Mr. R. C. Bradley showed *Argynnis Paphia* from Wyre Forest.

October 7th, 1889.—W. G. BLATCH, Esq., President, in the Chair.

Mr. G. W. Wynn showed *Gnophos obscuraria* from Wyre Forest, &c. Mr. R. C. Bradley showed series of *Selenia lunaria* and *tetralunaria*, exhibiting much variation. Mr. C. J. Wainwright, a moth, apparently belonging to the genus *Boarmia*, but which did not answer to the description of any British species. It was taken at Sutton.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: *September 26th*, 1889.—T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Mr. J. T. Williams exhibited *Cucullia absinthii*, L., from Portland. Mr. Wellman, *Plusia Chryson*, Esp., and *Dasydia olfascaria*, Hb. Mr. Jäger, *Lepidoptera* from the Lake district and the Isle of Man, among those from the last-named place

were some interesting forms of *Polyommatus Phlæas*, L., &c. Mr. Carpenter, *Gnophos obscuraria*, Hb., and varieties of *Bryophila muralis*, Forst., from Folkestone. Mr. Tugwell, a long series of varieties of *Peronia hastiana*, L., bred from larvæ collected at Braemar. Mr. Ince, *Lepidoptera* from Switzerland. Mr. R. Adkin, a series of *Hypermezia angustana*, Hb., bred from larvæ found feeding in shoots of Sallow, collected in Co. Derry, Ireland; the specimens showed considerable variation; and, from the same locality, *Padisca semifuscana*, St., which also showed variation both in the colours and markings. Mr. Jenner Weir, chrysalides of *Pieris napi*, to show that although their colour was very much affected by the environment of the caterpillar at the time of their metamorphosis, yet in no way did their colour approximate to that of their surroundings; they were all the produce of one female. A discussion ensued, Messrs. Carrington, Tugwell, White, South, Auld and Weir taking part. Mr. Turner exhibited a varied series of *Triphæna pronuba*, L., and said he was in doubt as to which was the variety *innuba*, Tr. Mr. Billups, on behalf of Mr. Tearoe, *Apanteles jucundus*, Marsh., from Deal.

October 10th, 1889.—The President in the Chair.

Mr. Weir remarked that at the last meeting he exhibited chrysalides of *Pieris napi*, when it was thought by some of the members that the apple-green specimens would, if placed in a strong light, lose their colour; he now exhibited the same chrysalides which had been exposed for weeks to the direct rays of the sun without the slightest fading of the green colour. Mr. Wellman, light forms of *Gnophos obscuraria*, Hb., from Lewes. Mr. South, referring to *Triphæna pronuba* and the var. *innuba*, stated that in the variety the wings and thorax were unicolorous; Mr. South also exhibited a variety of *Luperina testacea*, Hb., and a specimen of *L. Nickerlii*, Frr., the latter received from Mr. Baxter, of St. Ann's-on-Sea, Preston, also a long series of *Triphæna comes*, Hüb. Mr. Carpenter, *Pterostoma palpina*, L., from Essex and *Neuronia popularis*, Fb., taken at Streatham. Mr. Oldham, several species of *Lepidoptera* from the Cheshire Mosses. Mr. R. Adkin, examples of *Ellopiæ prosapiaria*, L., and *Boarmia abietaria*, Hb., and said that the larvæ of the last-named species were obtained from fir, and at first were fed upon fir and yew, but subsequently abandoned them for birch. Mr. Adye, a specimen of *Sphinx convolvuli*, L., taken at Christchurch. Mr. C. A. Briggs, an albino form of *Epinephele Tithonus*, L. Mr. J. A. Cooper, a bred series of *Deilephila galii*. Mr. T. R. Billups, a living specimen of *Gryllotalpa vulgaris*. Other exhibits were made by Messrs. Turner, Step, Frohawk, A. E. Cook, Briggs and Fremlin.—H. W. BARKER, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON: October 2nd, 1889.—The Right Hon. Lord WALSHINGHAM, M.A., F.R.S., President, in the Chair.

Mr. Arnold Umfreville-Henn, of Heaton Chapel Rectory, near Stockport, was elected a Fellow.

Mr. F. P. Pascoe exhibited a number of species of Insects of all Orders, collected by himself during the past summer at Brindisi, and in Greece and the Ionian Islands.

Mr. J. W. Douglas sent for exhibition specimens of *Lygus visciicola*, Puton, a species new to Britain, taken at Hereford, in September last, exclusively from mistletoe, by Dr. T. A. Chapman.

Mr. R. McLachlan exhibited nearly one hundred specimens of *Trichoptera* recently collected in Ireland by Mr. P. B. Mason. Only six species were represented, and of these, five had been previously recorded from the island.

Mr. E. B. Poulton exhibited a mounted specimen of the yellow powder from the cocoon of *Clisiocampa neustria* under a power magnifying 188 diameters. The powder was thus seen to consist of crystals so minute that the form could only just be made out. He said the powder was present in a crystalline form in the malpighian tubes, and was discharged from the anus. A discussion ensued as to the functions of the malpighian tubes, &c., in which Mr. Stainton, Lord Walsingham, Mr. M. Jacoby, Mr. P. B. Mason, Mr. McLachlan, and Dr. Sharp took part. Mr. Poulton also exhibited some photographs of living larvæ of *Hemerophila abruptaria*, showing different depths of colour which had been induced by experiment; the larvæ had been rendered very pale by being surrounded by green leaves and stems only, whereas they became extremely dark when numbers of dark twigs were intermingled with the leaves of the food-plant. All were bred from eggs laid by the same female. Mr. F. Merrifield said that Dr. Chapman had recently obtained similar results from experiments on the larvæ of *Ennomos alniaria*.

The Rev. Dr. Walker exhibited, and read notes on, a number of *Coleoptera*, *Neuroptera*, *Hymenoptera*, and *Diptera*, which formed the second instalment of the collection he had recently made in Iceland.

Mr. R. South exhibited a specimen of *Luperina testacea*, bred from a pupa found at the root of a species of *Silene* at Eastbourne; also a specimen of *Luperina Nickerlii*, Freyer, caught in Lancashire last August. He also exhibited, and read notes on, a long series of *Boarmia repandata*, bred from larvæ collected in North Devon. Mr. Poulton, Mr. Merrifield, and Lord Walsingham took part in the discussion which ensued.

Mr. J. J. Walker, R.N., exhibited a number of *Coleoptera* collected during the past summer in Cobham Park, Kent. Thirty-three species were represented, amongst which were the following, viz., *Eros minutus*, *Philonthus fuscus*, *Homalota hepatica*, *Abraeus granulum*, *Anisotoma grandis*, *Agaricophagus cephalotes*, *Thalycra sericea*, *Cryptophagus ruficornis*, *Platytarsus setulosus*, &c. He also exhibited a living larva of *Helops cæruleus*.

Mr. Jacoby exhibited a curious Phytophagous beetle found by Mr. J. H. Leech in the Corea. He stated that he was unable to determine the genus, as was also Mr. J. S. Baly, to whom he had submitted the specimen.

Mr. R. Adkin exhibited specimens of *Retinia resinella*, received by him from Forres.

Mr. W. Dannatt, exhibited a male specimen of *Papilio Antimachus*, Drury, from Lukolela, a missionary station about 500 miles from the mouth of the Congo. He stated that the species, although very rare, had a wide range, as three other specimens of it had been received from the Stanley Falls, more than 800 miles further up the Congo.

Lord Walsingham exhibited preserved specimens of the larva and imago of *Cidaria reticulata*, from the Lake District, sent to him by Mr. Hodgkinson.

Mr. J. Jenner Weir exhibited fore-wings of the males of *Argynnis Paphia*, *A. Adippe*, and *A. Atlantis*, denuded of the scales, in order to show that there was no dilatation or thickening of the median nervules and submedian nervure in that sex of these species; but that the supposed dilatation was produced by a dense mass of scales crowded together on each side of the nervules. He also read a short paper on the subject.—H. Goss, *Hon. Secretary*.

NOTES ON SOME LEPIDOPTERA CAPTURED IN NORWAY.

BY R. C. R. JORDAN, M.D.

Having spent some weeks of the last three summers in Norway, I shall venture on a short account of some of my captures there, premising that no species which was *only seen* shall be recorded. They are as follows:—

Pieris brassicæ—in June, resembling our spring or first brood.

P. napi—occurred to me under two, or it may be almost said, three forms.

1. Male: alar expanse, 50 mm.; fore-wing, central spot only faintly visible; tip of wing, and shading at the base, and along external border, darker than in any of my British specimens; inferior surface far more dusky, especially along the veins, and the ground colour of the lower wings of a much duller and paler yellow.

Female: also expands 50 mm. The same differences, compared with our females of the spring brood, exist here as in the male insect; the spots in the fore-wing are dark and well marked. These large, fine specimens were taken in June at Christiania.

2. Smaller in size, and differing from the last only in degree; the alar expanse being in the largest 45 mm.; they are more dusky than the specimens from Christiania, but in other respects similar to them. These were caught chiefly at Tønset.

3. *Bryonia*: taken at Jerkin on the Dovrefjeld. Female: alar expanse, 40 mm. The wing colour on the upper surface is exactly like specimens from the Gemmi and from Zermatt; on the under surface the general hue, and the veins especially, are more dusky than in any of my Swiss examples, the smallest of which expands 48 mm.

A male, caught with it, is much smaller than any of the males taken in the Swiss Alps under similar circumstances; a male from the Gemmi, which seems a fair typical example, expands 50 mm., and is quite spotless on the upper surface, but the tip of the fore-wing and the upper half of its posterior border, especially along the veins, is shaded with dusky, as are also the base of the wing and the superior border; the veins are well-defined, and also dusky. The under surface of the upper wings is white, and has green veins shaded with black, and the traces of two spots are visible, the upper being most plainly marked; the lower wings are light yellow, with dusky green veins. A male from Jerkin expands only 43 mm., and has the upper surface spotless white, the veins at the superior angle of the fore-wing are just slightly shaded with dusky, and there is the same shading at the base; the veins are clearly seen. The inferior surface is much as in the Swiss specimens, but the spots on the fore-wing are more faint, and the veins less dusky. The only difference between the Jerkin males, and males of the variety *frigida*, which I have from the island of Anticosti, is that in these last the spots are invisible on either side, and that the alar expanse of the smallest of three is 50 mm.

Anthocharis cardamines—Koppang, &c.

Gonepteryx rhamni—South Norway.

Thecla rubi—Koppang, &c.

Polyommatus Phlæas—taken at Ormeim, Romsdale, but seen in other places. Another and larger *Polyommatus* was seen many times.

Lycæna Ægon—caught in many localities, Söholt, Sande, Romsdale, &c. *L. Icarus*—Christiania, Bergen, Faleide, &c. *L. Pheretes*, Jerkin, common, rather smaller and perhaps not quite of so bright a colour as Swiss specimens, the outer row of spots on the inferior surface of the fore-wing is wanting in several of the males, the central discoidal spot alone remaining. It is strange that our northern variety, *Artaxerxes*, should have the same peculiar unocellated spots on the lower wing as the two mountain insects, *Lycæna Pheretes* and *L. orbitulus*.

Vanessa c-album—in the former paper this was heedlessly spoken of as *V. comma*. *V. urticæ*—has been before mentioned; last year, 1888, the larvæ were so abundant in the Romsdale, that every nettle was stripped of all its leaves. It must not be thought that the form "*polaris*" is met with in the high Alps, because one was reared by me from a Visp Valley larva; aberrations of all sorts more often occur in bred insects, and this was doubtless one of these accidental appearances.

Melitæa Athalia—of this species I took one female near the Châlets on the way to Storhatten, above Ormeim, which differs very slightly from a female caught in South Devon. Its alar expanse is 39 mm. On the upper-side the English specimen has the transverse lines, perhaps, a trifle broader, the spots also which form the tawny bands on the lower wings are rather larger, and not quite so crescent-shaped. On the inferior surface the difference is a little more marked; in the Devonshire insect the upper wings are tawny, excepting the external and posterior borders, both of which are bright straw-yellow; in the Norway specimen the posterior border alone is of this colour, and paler. The tawny ground-colour in the British specimen has black markings, forming dotted lines, extending for about one-third the breadth of the wing; in the Ormeim insect the lines are dusky, not black, but extending the whole breadth; the inferior wings are much the same, save that the Devon insect is rather brighter; the palpi in both are white on the outside, with a slight tendency to become tawny at the apex. The Dovrefjeld specimens are very small, varying in alar expanse from 30 to 35 mm., but the colour and markings of those taken by me did not differ materially from dark forms of *Athalia*.

Argynnis Euphrosyne—is common in many places, and many were taken in the Romsdale which do not appear to differ at all from our usual type; but in a swamp at Tönset a small dark form was met with

commonly, alar exp., 38 mm., exactly resembling the types of *var. Fingal*, given me by Dr. Staudinger. *A. Pales*—caught on the Dovrefjeld, and also on the heights above Ormeim; both of these seem identical with the form *lapponica*. *A. Lathonia*—one taken at Faleide. This is a very fine insect, alar exp., 53 mm., larger than any other in my collection. *A. Niobe, var. Eris* (50 mm.)—I have one of the same size taken by me in the Alps; the under surface of the posterior-wings in this specimen is of an unusually pale colour, but, of course, in a single example this may be only accidental.

Erebia lappona—common at Jerkin, and taken also near the snow line on Störhatten, above Ormeim. The lower wings on the inferior surface of my Dovrefjeld specimens are, as a rule, not as pale a grey as my Swiss examples; but this varies, and in one Lapland insect the grey colour is perfect. *E. ligea*—the typical form of *ligea*, as it occurs in the warmer valleys of Switzerland, is a large and very handsome *Erebia*. The alar expanse of average specimens from Interlachen is, in the male, 50 mm., in the female, 53 mm.

The fore-wings are of a rich dark velvet-brown, with a marginal red band near the tip; extending nearly the whole breadth, this contains three or four black dots, the third of which is usually the smallest, and often deficient; the two upper and the fourth or lowest have most frequently a white central pupil; the inferior wings are the same rich colour, with the same marginal band, but divided into partitions by the veins, and in the three lower partitions, sometimes in the upper ones also, is a black spot, with generally a white central pupil. On the under surface, the upper wings are a paler brown, with a fulvous band, and the lower wings are also paler than on the upper surface; the marginal band being reduced to three or four red eyes, with black pupils, having for the most part a white centre, but the position of the marginal band is outlined by a more or less continuous white line, sometimes very strongly marked.

The Norwegian specimens vary from 40 to 50 mm. in alar expanse, and are of a darker colour than the Swiss form, the band and spots are much the same, save that, as a rule, the spots are smaller and less frequently ocellated, although some females have the white central pupils well marked. On the under surface the red colour of the band is frequently suffused over the other portion of the fore-wing, and in the lower-wings the white band seems rarely much extended beyond the spot which marks its commencement. This insect is very abundant in many parts of Norway. It seems to me a transition to the ordinary form of *Euryale* of the High Alps, the following description being taken from a typical male caught at Zermatt:—alar expanse, 45 mm. Fore-wings dark black-brown, with a marginal red band, narrower towards the internal border. This band contains three ocellated spots, the two upper confluent, inferior-wings also deep brown, with the position of the band indicated by five semicircular red spots, three of which have black eyes, two of these having white pupils. On the lower surface the upper wings have their ground-colour strongly tinged with red, shading from the marginal band, whilst the lower wings are dull brown, with two eye spots, black with white centres, answering to the ocelli above, with a slight, faintly-marked red ring round each, and no trace of the white line.

Euryale varies much, but this is the common and typical form in which it occurs.

Two insects, male and female, were given to me (said to be from North Norway) as types of the var. *Adyte*. These are different from anything taken by myself; the male has alar expanse 40 mm., and is a lighter brown than *Ligea* usually is, the red marginal band is distinct in both upper and lower wings; and in the upper wing the two first ocelli are distinct from each other, and have faint white pupils, the lower is blind, in the lower wing the band is continuous, or nearly so, and has three dots without central pupils. On the inferior surface the ground-colour is reddish-brown; the marginal band in the upper wing being distinct, and not shaded into the ground-colour; all three eyes are pupillated; in the lower wing the marginal band is of a paler colour, and outlined by a well-marked white line; in the band are three ocelli, black, with red rings round them, and white centres. The female is 43 mm., and has four pupillated spots in the band of the fore-wing; and in the lower wing the red band is very marked and has only two black spots; beneath the upper wing has a distinct band with four pupillated spots; in the under wing is also a distinct band well outlined by a white line, and having three large black eyes with white centres. Of course the description (of *Euryale* especially) will not apply to every specimen, for the butterfly varies much; indeed, a common form of the female where, on the inferior surface, the lower wings have a band of a light, tawny-ochre, almost straw coloured, is not even mentioned.

These two *Erebica* (*lappona* and *Ligea*) are the only *Erebica* taken by me in Norway.

Chionobas Norna—taken by me on the Dovrefjeld, and mistaken for *C. Jutta*, as before said. The specimens from Jerkin, as compared with a pair of Lapland insects in my possession, differ in being much less tawny in general colour, and in having the fulvous band in the upper-wings much more markedly divided by the veins, also in wanting the ocellus at the anal angle of the lower wing; in other respects the resemblance is complete.

Of the genus *Pararge* it is not easy to speak; but, firstly, the specimen in question taken at Bergen shall be carefully described:—

It is a male with an alar expanse of 35 mm., and is the smallest of any species of *Pararge* in my possession. The fore-wings are dark brown, and have a large black eye with a white single pupil at their upper angle, enclosed in a deep fulvous patch which forms a band, divided by the veins, but extending nearly the whole breadth of the hind border, and parallel to it, along its posterior margin, the inferior-wings are the same brown colour, with a similar deep fulvous patch, parallel to the hind-margin, divided into distinct portions by the veins, two of these contain moderately large ocelli with single white pupils, but the upper one is blind, the black spot having no pupil. On the inferior surface this Bergen specimen has the upper wings tawny, shaded with fuscous from the base for three-fourths of the wing; the posterior border is also fuscous, with a darker line down its centre; the anterior or basal fuscous shading being marked by three darker transverse lines across the discoidal cell; the ocellus is large with a single central white eye spot. The lower wings are dull brown with narrow wavy lines; beyond the centre they become lighter in colour, save at the extreme margin which is bordered with a double dark line; in this lighter interspace are five eyelets formed by two concentric rings of brown,

and having a black central spot, with a white pupil in three of the five, the one at the anal angle has two minute black dots, each with a white spot, and the second of the row has no black centre.

The butterfly which approaches nearest to this in my collection was taken by me at Zermatt, and certainly if one be *Mæra*, the other must go with it, they must stand or fall together.

Its alar expanse is 44 mm. The upper wings exactly resemble the last, save that the posterior border of the fulvous line is not parallel to the border, but has a series of outward curves, one between each vein; the under wings have three black spots with white pupils, and a very small one at the anal angle. On the inferior surface, also, the resemblance is nearly exact, save that in the upper wing the large ocellus is supplemented, both above and below, by a very minute black spot with a white centre, and the posterior border is certainly rather broader; the lower wings are brown with darker lines, as in the other, but the lighter part is not so clearly marked, except at its commencement; and there are six ocelli, each with a black spot and a central white pupil, save in the ocellus at the anal angle, where, as before, two minute dots take the place of the single larger one, each, however, having the central white pupil as before.

Very different from this is the smallest genuine male *Mæra*, taken out of a large series in my cabinet.

Though the large ocellus in the upper wing has a single pupil above, yet, on the inferior surface it has two white pupils, and the lower wings are of an ashy-grey beneath and not brown; the arrangement of the ocelli is the same as in the Zermatt specimen; this example came from the Visp Valley. It would seem to me that many of the June examples of *Hiera* taken in the Romsdale present a far nearer approach to *Mæra*, or rather to the var. *Adrasta*, than this Bergen specimen; in a female *Hiera*, from the Romsdale, and a female *Adrasta* there is absolutely no difference whatever on the superior surface, except in the intensity of the colour, the basal two-thirds of the upper wing in the German insect being tawny, whereas the Norwegian butterfly is brown, in the lower wing also the Norwegian specimen is of a richer and deeper brown, and it is also slightly larger in size (50 mm., the *Adrasta* 48 mm.); what has been said of the upper surface may be also said of the lower, save that in the *Adrasta* the under wings have a greyer tint.

These spring forms of *Hiera* in Norway have added much to the growing conviction in my mind that it is utterly impossible to draw any distinct and permanent line (unless it be found in the generative organs, which I have not examined) between the perfect insects in the three species *Mæra*, *Hiera*, and *Megæra*. The shape of the wing is no help. In the male the posterior border is straight in all, in the female, curved outwards; size and colour certainly give us no reliable guide, and, indeed, I know of none. This seems a strange doctrine to an Entomologist in Britain, where *Megæra* has become so fixed and stable a species, and so little subject to variation; but a large series of European specimens has seemed to me conclusive on the point.

Cœnonympha Pamphilus—common, and in no way differing from British forms.

Hesperia comma—in the Romsdale, near Stueflaten, approaching strongly to the var. *catena*.

A species of *Syrichthus* was most certainly seen by me, but not caught, at Eidsvold.

Of *Sphingidæ* only one was taken by me, at Ormeim, viz., *Sesia scoliæformis*. I found the flattened remains of a magnificent specimen on the doorstep of the hotel, just an hour or two before leaving, so that it was too late to examine the birch trees for more. It had clearly been mistaken for a wasp, and killed a few minutes before my finding it.

I saw a *Zygæna* on the Dovrefjeld, but could not take it.

Nudaria mundana—very abundant at Hellesylt.

A species of *Setina* was seen between Lille Elvdal and Jerkin, but not caught.

Callimorpha jacobææ—Christiania.

Spilosoma menthastri—Christiania.

Hepialus humuli—Jerkin: two male specimens, not differing from our common form.

Saturnia pavonia-minor—larva found near Christiania.

Pterostoma palpina—taken near Throndjem.

There are some *Noctuæ* yet unnamed, so that the list must stop here for the present, but it may be mentioned that at Jerkin I was fortunate enough to take a female *Anomogyna lætabilis*. This was named for me by Dr. Staudinger, to whose kindness I am indebted for a male of the same species from Labrador.

Last year two plume moths were added to my previous list, viz., *Platyptilia Zetterstedtii*, caught by the Slettafos, and *Leioptilus osteodactylus*, taken both at Ormeim and at Faleide. *Crambus margaritellus* was also captured at Sande.

This list is not as numerous as it ought to have been, for travelling and entomology are sometimes antagonistic forces; I can, however, fancy no more pleasant holiday to a naturalist than a quiet month at Jerkin, he must not expect to find butterflies as abundant as in the Swiss Alps, but the moths amply make up for their deficiency; even old friends wear generally new faces, and he will make plenty of new friends also; indeed, only to watch the numberless light grey forms of *Gnophos sordaria* flitting over the fjeld in the July evenings is, in itself, worth all the toil of the journey.

TRIFURCULA PALLIDELLA IN THE ISLE OF PURBECK.

BY EUSTACE R. BANKES, M.A., F.E.S.

“Apparently attached to *Genista tinctoria*, and only three specimens hitherto taken in Britain!” Such was my mental comment—based chiefly on Mr. Stainton’s note in Ent. Mo. Mag., xxii, p. 263—as, early in the past summer, I entered the name of *T. pallidella* on my list of species to be specially worked for during the season, and called to mind a likely-looking rough pasture where I had noticed the *Genista* growing freely.

Various causes prevented me from visiting the spot during August, which seemed to be the right month for the imago; but at length, on the evening of September 5th, I carried out my long-standing intention, and had not been in the field a couple of minutes before I netted a small pale yellow moth, which I felt almost sure must be the much-coveted prize! Two or three more were taken that evening, and by dint of hard and systematic work during the next fortnight or so—the weather being everything that could be desired—I secured a most beautiful series, including one or two females which are considerably darker, both as to the fore- and hind-wings, than the males. *T. pallidella* is decidedly scarce, and is a most capricious and aggravating species to work for; it undoubtedly rests by day concealed among the roots of the thickest tufts of herbage, and only creeps up from its hiding-place late in the evening, appearing on the wing for half an hour just at sunset; it cannot by any possible means be induced to show itself or to fly, except at that time, and then only when the weather exactly suits its particular fancy, so it is often a sore trial of patience waiting, when the light is waning fast, for it to turn up. Occasionally, when one happens to be standing near where a newly-emerged ♀ is waiting to be courted, one may perhaps net two or three males in a minute or two, and then not see a sign of another that evening!

Thinking that, like many other species, it might fly at sunrise as well as sunset, I got up early one calm morning, and was on the ground at 4.45 a.m., long before the sun was up, but it did not show at all on the wing, though I boxed one specimen which was at rest on a blade of grass.

In the August number of the “Entomologist,” Mr. Hodgkinson records the capture of his second specimen in Lancashire, which apparently, though no date is given, must have been taken in the first three weeks of July—a curiously early time for it to occur in the

North, when down here it is fully out in the middle of September! However, as his first specimen occurred in the end of August, and I believe that Mr. A. F. Griffith took both his examples in that month, it seems probable that the species is out over a considerable time.

T. pallidella is, in this country, clearly attached to *Genista tinctoria*, and I shall do my utmost next season to discover the larva on that plant, and to work out its life-history. Sorhagen simply mentions "*Genista*" as its food-plant, and we learn from Mr. Stainton's note above alluded to that it has occurred on the Continent amongst *Genista sagittalis* and *G. germanica*.

In conclusion, I may mention that I had, last August, the pleasure of taking, near here, half a dozen specimens of *T. immundella* amongst broom, which is a very scarce plant in Purbeck. No species of the genus *Trifurcula* had, up till that time, been met with in the county of Dorset.

The Rectory, Corfe Castle, Dorset :

October 22nd, 1889.

REMARKS ON MR. JAS. EDWARDS' LIST OF NORFOLK HEMIPTERA.

BY EDWARD SAUNDERS, F.L.S.

Mr. Edwards has recently sent me his list of the *Hemiptera* of Norfolk, published in the Transactions of the Norfolk and Norwich Naturalist's Society, vol. iii, 1884, and his Supplement to it, published in the same Society's transactions of this year. Such local lists are always interesting, but this one especially so, as it is drawn up by a well-known specialist in this Order, and records the result of ten years of his work, assisted by Mr. Thouless and others, so that there is little doubt that the subject has been thoroughly investigated, and that the list is a fair record of the *Hemiptera* Fauna of Norfolk. This being so, it seems to me interesting to examine the contents of the list and try to point out some of the peculiarities of the relations between Norfolk and its Bugs.

In the *Heteroptera*, Norfolk can apparently boast of three species unrecorded from any other county, viz., *Lygus atomarius*, Meyer, *Chlamydatus flaveolus*, Reut., *Stålía boops*, Schiödte, all of which have been introduced by Mr. Edwards himself, and the following which are amongst the rarest of our species:—*Bathysolen nubilus*, Fall., "one

example from Mr. F. Norgate," and "a dead specimen at roots of grass in a lane off Unthanks Road," Mr. Edwards. *Gastrodes abietis*, L., "in cones of spruce-fir, Merton Park." *Teratocoris antennatus*, Boh., "on rushes, Hunstanton, Weybourne, Ranworth." *Bothynotus pilosus*, Boh., "Booton Common, July 8th, 1886, one developed ♂ by sweeping," this, as Mr. Edwards remarks, is "the eighth recorded British example." *Globiceps dispar*, Boh., Earlham, Coxford, Hellesdon, at roots of plants. *Conostethus salinus*, Sahlb., "Saltmarsh at Hunstanton." *Acompocoris alpinus*, Reut., "on Scotch fir, very rare." *Gerris rufoscutellata*, Latr., Mousehold Heath, Drayton Drewray, and Horning. *Aphelocheirus æstivalis*, Fab., locality unrecorded. I select these as I think the localities may be of interest to our readers. I have never collected in Norfolk, but I have several times been on the Suffolk coast, at Lowestoft and Southwold, and near the latter place I met with two rarities not recorded from Norfolk, viz., *Myrmedobia inconspicua*, D. & S., at the roots of grass in a sandy spot near Southwold Pier, and *Brachysteles pili-cornis*, Muls., by sweeping along a low elm hedge, near the old ruin at Walberswick, near Southwold; this species is found on the Continent under elm bark, and should therefore be sought for by beating. I have little doubt that both species will be found in Norfolk.

The complete absence of certain genera of the larger *Heteroptera* from the list is certainly remarkable; *Eurygaster*, *Sciocoris*, *Eysocoris*, *Strachia*, *Coreus*, *Syromastes*, *Stenocephalus*, *Aradus*, are all unrepresented. None of them are rare, although some which are widely distributed are local. On a sandy coast like that of Yarmouth, *Eurygaster*, *Sciocoris*, and *Stenocephalus* might reasonably be expected to occur, and the other genera, usually obtained by sweeping, should certainly be found in Norfolk, unless they can prove an *alibi*.

Among the less conspicuous genera the following are absent, which will probably find a place some day in the list: *Henestaris*, *Eremocoris*, *Chilacis*, *Campylostira*, *Aneurys*, *Miridius*, *Halticus*, *Piezostethus*, but they are none of them common, and most of them local. The only really common species which I fail to see recorded is *Dicyphus errans*, Wolff. Surely this must be about in many localities; I would commend it to the careful attention of the Norfolk Hemipterists. I have only dealt with the *Heteroptera*, as the *Homoptera* are in the hands of Mr. Edwards, who has made them his special study, and I do not presume to know sufficient about them to criticize his list.

St. Ann's, Woking :

October 13th, 1889.

SECOND SUPPLEMENT TO ANNOTATED LIST OF BRITISH
ANTHOMYIIDÆ.

BY R. H. MEADE.

(Concluded from p. 426).

HYDROTÆA, R. Desv.

H. PARVA, *sp. n.*

♂. *Nigra nitida, abdomine pallide-cæsiō tomentoso, linea nigra dorsali signato. Oculi magni nudi arcu contigui; alæ sub-brunescens venis transversis appropinquis, apiceque venæ longitudinalis quartæ leviter recurvo; halteres nigri. Femora antica unidentata; tibiisque anticis excavatis.* Long., 3 mm.

Head: forehead flat, epistome slightly prominent; eyes large and bare, closely and deeply contiguous; antennæ short and grey, surmounted by a snowy-white triangular spot; arista almost bare; palpi black. *Thorax* shining black, with hoary spots on the shoulders, and four medio-central dorsal bristles behind the suture. *Scutellum* bright black.

Abdomen oval, and tapering towards the apex, which is pointed, with small subanal processes; colour, light bluish-grey with the first segment black, second, third and fourth segments marked on the dorsum with a longitudinal black stripe, which, tolerably wide at first, narrows towards the apex.

Wings pale brown, transverse veins rather near together, the internal one being placed over the discoidal cell nearly two-thirds from its base; fourth longitudinal vein curved upwards a little at its extremity. *Calyptra* sub-fuscous. *Halteres* nigrescent.

Legs black, fore femora with one short sharp tooth on the under-side near the end, and also with a blunt hairy tubercle placed a little behind and on the inner side of the tooth; fore tibiæ deeply indented at the base, and a little thickened along their front half. Middle femora with two long blunt spines beneath their base; middle tibiæ with two bristles on the inner sides near the middle; hind femora a little curved, having a row of hairs of nearly equal lengths along their outer sides as well as on the basal halves of their inner surfaces, which are then bare to near the end, where three or four bristles are placed; hind tibiæ with a few long bristles on their outer and anterior surfaces, and with a number of short adpressed hairs on their inner extremities.

I found a single male of this little fly, which is peculiar by being much smaller than any other that I know in this genus, in an osier bed near Buckingham in August, 1887. It seems closely allied to the *Musca glabricula* of Fallén, and may possibly be identical with it; but his description is very short, and neither he, Meigen, nor Zetterstedt mention the colour of the abdomen, but indicate that the whole insect is black, so I have decided to describe it as a new species, and give a somewhat full diagnosis.

The *H. floralis* of R. Desvoidy is given as a synonym of *H. glabricula*, but he only described the female, and I have not seen that sex of *H. parva*.

TRICHOPHTHICUS, Rond.

T. HIRSUTULUS, Zett.

In my last Supplement I omitted to record the occurrence of this species in

Britain. Mr. Verrall found it plentifully in Arran in June, 1882, and kindly sent me several specimens; I also captured three males myself at Baslow, in Derbyshire, in July, 1887.

It is oblongo-cylindrical in shape, shining black, with a grey abdomen having an interrupted longitudinal stripe. The eyes are rather long haired; the arista is decidedly pubescent, almost sub-plumose; the wings are mostly nigrescent, and the halteres are also described as being of the same colour, but in all my specimens they are testaceous; the hind tibiæ are very hairy on both sides, and there is a strong blunt spur on their inner side at the extremity; the under-surfaces of the middle femora are armed with a row of very strong long spines.

T. INNOCUUS, Zett.

This species, which was also found by Mr. Verrall at Arran in June, 1882, is very similar to the former in general shape and colour; but has the eyes in the male more closely contiguous, and is destitute of the spur at the end of the hind tibiæ, as well as of the spines beneath the middle femora; the hind tibiæ are furnished with hairs on their sides in a very similar manner to those of *T. hirsutulus*.

CHORTOPHILA, Macq.

C. CURVICAUDA, Zett.

This minute species (only about 3 mm. in length) possesses several well marked characters: the forehead and face are prominent; the thorax is dull grey and indistinctly striped; the abdomen in the male is sub-cylindrical and greyish-black, becoming glabrous towards the apex; the anal segments are globular, dilated and reflexed; the wings are somewhat nigrescent, especially at the base, and armed along the whole costa with short spines. The female has the eyes only moderately separated, and the abdomen (which is ovoid and pointed) of a shining brown-black colour, with a metallic lustre.

This little fly was captured abundantly at Shiere, near Guildford, in Surrey, by Dr. Capron, in April, 1888, who kindly sent me several specimens of both sexes.

PEGOMYIA, R. Desv.

P. FLAVIPES, Fall.

This fly is distinct from the *P. flavipes* of Desvoidy and Macquart, a species which I do not know.

P. TRANSGRESSA, Zett.

Miss R. Prescott-Decie sent me a male of this rare fly in April last, which she had captured near Chagford, South Devon, in May, 1888. It has not yet been recorded as British. The antennæ and palpi are black; the eyes in the male are contiguous, and the triangular space between them above the antennæ is red. The thorax is cinereous and indistinctly striped. The abdomen is fusco-ferruginous, linear, and depressed with very large complicated yellow subanal processes. The legs are testaceous, with the exception of the fore femora, which are partly nigrescent, and the tarsi, which are black.

SYNOPSIS OF THE BRITISH ORTHOPTERA.

BY ELAND SHAW, F.E.S.

(Continued from page 421).

iv.—PACHYTYLUS, Fieber.

In this genus the species are much larger. Head, with the frons, joining the vertex at an obtuse angle; frons not sulcate in the middle, but sub-convex, with a slight depression around the ocellus. Foveolæ of the vertex small, triangular, with their bases just anterior to the eyes. Pronotum with a more or less elevated median ridge, no lateral ridges; posterior margin more sharply angled than in *Stenobothrus* and *Gomphocerus*. Elytra with the ulnar area wide; anterior ulnar vein at the extremity of the discoidal cell bent downwards somewhat abruptly, beyond this running very straight and parallel with the posterior radial vein, and enclosing with the latter a narrow area containing an accessory vein. Posterior femora with the superior ridge sharp, with a few serrations. First segment of the abdomen with the external auditory orifice partly open.

TABLE OF SPECIES.

- 1 (2) Pronotum with the anterior margin less produced, median ridge slightly elevated. ♂ and ♀ of equal size 1. *migratorius*, Linné.
- 2 (1) Pronotum with the anterior margin produced further forwards, median ridge considerably elevated. ♂ much smaller than the ♀ ...
2. *cinerascens*, Fab.

1.—PACHYTYLUS MIGRATORIUS, Linné.

Gryllus (Locusta) migratorius, Linné, Syst. Nat., ed. x, p. 432, ed. xii, i, 2, p. 700; Donovan, Brit. Ins., viii, 49, pl. 270.

Lo. migratoria, Steph., Mandib., vi, p. 20.

Pachytylus migratorius, Fisch., Orth. Eur., p. 393, tab. xviii, figs. 12, 12a; Brunner, Prod. der Eur. Orth., p. 171.

General colour yellowish or greenish-grey, livid, or partly paler green. Head with the vertex between the eyes flat, sloping forwards and downwards, with a central median ridge, which anteriorly meets a bluntly angled transverse ridge, separating the vertex from the frons. Behind the eyes is a curved fuscous streak on either side. Frons with the ridges on either side parallel, fuscous or dark greenish-blue. Mandibles blackish-blue. Pronotum pale green, sometimes with a fuscous streak on either side, with the anterior margin slightly angled in the middle; median ridge not much elevated, nearly straight when seen from the side, slightly notched by the cross furrow. The pronotum is considerably broader posteriorly than anteriorly, anterior half compressed, spreading out behind suddenly, with a well marked

shoulder. Elytra yellowish or greenish, with numerous fuscous mottlings. Wings hyaline, with the veins fuscous. Posterior femora greenish-yellow outside, with a large dark blue patch inside, sometimes divided into two portions by a yellow band, with a blue ring before the knee, separated from the large blue patch by a broad yellow band. Posterior tibiæ livid or yellowish, faintly blue at the apex. Sexes of equal size. Length, 50—68 mm.

By the characters given in the above table of species, *migratorius*, L., can easily be distinguished from *cinerascens*, Fab. The difference in the form of the pronotum is striking, and while in *migratorius* the posterior tibiæ are livid or inclined to yellow, in *cinerascens* they are always more or less red. The form of the small ridges on the vertex also makes a good distinctive character, but they are sometimes very obscure. There also seem to be some differences in the structure of the subgenital lamina of ♀, but of these I have not availed myself now, not having a large enough number of specimens at my disposal.

Though neither of these species, in all probability, breeds in this country, their frequent occurrence and wide range when they visit us, give them a right to a place in our fauna lists. Most of the specimens I have seen are *migratorius*, and my two came from the Southern Counties; but of the "locusts" which occurred in some numbers in Yorkshire in 1876, Mr. R. McLachlan identified the specimens which were sent to him as *cinerascens*, Fab. (Ent. Mo. Mag., 1877, xiii, 180). Two of these specimens I have lately had the opportunity of examining through the kindness of Messrs. Roebuck and Waite of Leeds. One of them is undoubtedly *cinerascens*, Fab., ♀, captured at Spurn; but the other (a ♂) taken in Leeds ought, I think, to be referred to *migratorius*, L. In 1886 Mr. Wallis Kew sent me for identification a *migratorius* ♀ from Withern in Lincolnshire. Mr. E. Saunders has *migratorius* from Child's Hill, Hampstead, and Hastings, and of two specimens of *Pachytylus* recently sent to me by Rev. E. N. Bloomfield, one was *migratorius*, L., and the other *cinerascens*, F., ♀, a very large specimen, with elytra 62 mm. long; these were taken at Fairlight, Hastings.

In an interesting paper, entitled, "Locusts in Yorkshire," read before the Huddersfield Scientific Club, February, 1877, and published in "The Naturalist" (New Series, ii, 1876—7, pp. 129—137, and 145—150), Mr. W. Denison Roebuck collected the older records of the occurrences of these species, together with a full account of those captured in 1876.

According to Brunner, *cinerascens* is the more widely distributed species, and in Europe is most plentiful in the south-west and along the Mediterranean Sea, while *migratorius* occurs chiefly in the east. Baron de Selys-Longchamps states that *cinerascens* breeds regularly in Belgium, and was of opinion that it also did so in Britain, but I cannot agree with him in this.

2.—PACHYTYLUS CINERASCENS, Fab.

Gryllus cinerascens, Fab., Ent. Syst., ii, p. 59.

Pachytylus cinerascens, Fisch., Orth. Eur., p. 395, tab. xviii, figs. 13, 13a-e; Brunner, Prod. der Eur. Orth., p. 172.

Gryl. (*Locusta*) *danicus*, Linné, Syst. Nat., ed. xii, i, 2, p. 702.

Locusta Christii, Curtis, Brit. Ent., pl. 608.

Same as *migratorius*, with the following differences:—Head with the ridges on the vertex not so marked, the median one very slight, while the absence of the transverse one allows the vertex gradually to merge into the frons. Pronotum not so much compressed anteriorly, with the anterior margin more acutely angled in the middle, median ridge elevated into a distinct crest, divided into two parts by the cross furrow, with the part anterior to the cross furrow more elevated than that posterior to it. Posterior tibiæ red. ♂ much smaller than ♀.

Length, ♂, about 45 mm., ♀, about 60 mm.*

The occurrence of this species has been mentioned under *P. migratorius*. The specimen recorded by Mr. H. N. Ridley (Ent. Mo. Mag., xx, p. 215) from Co. Kerry was really a *M. grossus* (q. v.). Curtis' figure and description of *Lo. Christii* must, I think, refer to this species, but the figure is drawn with the legs greenish; his type is, however, out of reach, as I believe it is now in Australia.

Linné's *danicus* (Syst. Nat., i, 2, p. 702) is probably synonymous with *cinerascens*, Fab., and, according to the strict law of priority, ought perhaps to be substituted for it, but Fabricius' name has been in universal use since 1793.

I have some specimens from Corfu in which the head, pronotum, and posterior femora are bright green, and the posterior tibiæ rich red; but generally the species is not so brightly coloured, and is sometimes much darker.

REPUTED SPECIES.

Edipoda carulescens, Linné.—Stewart (Elements of Nat. Hist., 1805, ii, p. 95) gives this as British, but its occurrence is very doubtful. In Europe it is generally distributed, except in the North, and it is found in the Channel Islands.

Psophus stridulus, Linné.—The same author gives this as British, and I hope it may turn out to be so, but we can hardly admit it without further evidence. It is found over North and Middle Europe. It is a thick, heavy looking species, the prosternum has no central projection, the median ridge of the pronotum is somewhat elevated, and has a depression on either side, the elytra are broad compared with their length, and not acuminate at the apex; the wings are sinuate at the apex and of a deep red, with a broad, dark, fuscous marginal band. It occurs, according to Brunner, in moist, fertile mountain meadows.

Pezotettix pedestris, Linné, vide *Stenobothrus parallelus*, ante.

v.—SCHISTOCERCA, Stål.

This genus contains the largest British species. The frons is perpendicular; the pronotum is crossed by three distinct furrows; there is a median ridge, but no lateral ones; the prosternum has a central projecting spur; the elytra have the discoidal area irregularly reticulate, and have no accessory vein; the posterior femora are serrated along the superior margin; the cerci are compressed with the apex bluntly pointed.

* The measurements here, as elsewhere, are taken from the anterior border of the vertex to the most posterior part of the body, or (as in this case) of the closed elytra.

1.—SCHISTOCERCA PEREGRINA, Oliv.

Acrydium peregrinum, Olivier, Voyage Emp. Ottoman, ii, p. 424.

Acridium (*Schistocerca*) *peregrinum*, Stål, Rec. Orth., i, p. 65.

Schistocerca peregrina, Brunner, Prod. der Eur. Orth., p. 215, fig. 50.

Yellow or greenish-yellow, with fuscous markings. Head with the vertex broad, depressed in the middle, with raised edges; frons with a depression around the central ocellus, otherwise not sulcate, occiput with a dark streak on each side. Pronotum constricted anteriorly, suddenly widening out behind the third transverse furrow; anterior margin not angled, posterior margin bluntly angled with a thickened edge; median ridge not elevated, crossed by three deep furrows, behind which it is more clearly defined. Elytra with the mediastinal and scapular areas, and the basal part as far back as the dividing vein, yellowish, the rest of the elytra subhyaline, transverse veins pale, except at the fuscous spots. Fuscous mottlings all over the elytra formed by one or a number of adjoining cells being bordered with fuscous. Wings hyaline, with the veins ferruginous, sometimes rosy towards the base. Prosternum produced into a long, straight, central projection. Supra-anal plate ♂ sulcate in the middle, pointed posteriorly. Subgenital lamina ♂ produced far backwards, curved upwards, with a triangular notch at the apex. Length, 65—70 mm.

In 1869 this species was found in considerable numbers in the Midland and Southern Counties of England, also near Waterford, in Ireland (Proc. Ent. Soc. Lond., 1869, xxviii). The most northerly locality reached seems to have been Burton-on-Trent, unless two unnamed specimens from Yorkshire, referred to by Mr. W. D. Roebuck in his paper "Locusts in Yorkshire" (*loc. cit.*, p. 145), were of this species. Since 1869 there seems to be no record of its capture here. Brunner tells us that its proper home is North Africa, as far south as the river Senegal and the Red Sea, and that it has also occurred in Corfu, the Balearic Islands, Portugal and Syria. In my collection are several specimens from the collection of the late Sir Sidney Saunders, taken in 1845 in Albania.

vi.—TETITIX, Charp.

This genus may be at once distinguished from the rest of the *Acridiidae* by the small size of the species, by their having the pronotum produced posteriorly into a long process, and by the absence of pulvilli or cushions between the claws. Brunner describes six species as European, of which we have two in this country.

TABLE OF SPECIES.

- 1 (2) Pronotum tectiform, with the median ridge considerably elevated; process not reaching back beyond the posterior knee-joints...

1. *bipunctatus*, Linné.

- 2 (1) Pronotum more flat, with the median ridge not so much elevated; process reaching beyond the posterior knee-joints 2. *subulatus*, Linné.

1.—*TETTIX BIPUNCTATUS*, Linné.

Gryllus bipunctatus, Linné, Syst. Nat., i, 2, p. 693.

Tettix bipunctata, Fisch., Orth. Eur., p. 425, tab. xviii, figs. 21, 21a, b.

Tet. bipunctatus, Brunner, Prod. der Eur. Orth., p. 235.

Acridium bipunctatum, laterale, binotatum, vittatum, zonatum, ochraceum, hieroglyphicum, scriptum, variegatum, Zett., Orth. Suec., p. 115, et seq.; (*Acryd.*), Steph. Mandib., vi, pp. 35, 36.

Acrydium ephippium, cristatum, Thunberg, Nova Acta Upsal, vii, p. 161; Steph., Mandib., vi, p. 35.

Acryd. nigricans, Sowerby, Brit. Misc., v, i, pl. 74.

Tetrix Schrankii, Fieb., Ent. Monogr., pp. 130, 134, tab. x, figs. 17—19.

Colour generally fuscous, either unicolorous, or with a pale dorsal streak. Head with the vertex prominent, meeting the frons at an acute angle; eyes prominent, lateral ocelli above the insertion of the antennæ, central ocellus at the lower end of the frontal sulcus; frons looking forwards and downwards, sulcate above, with a raised ridge on either side, replaced in the middle by a single median ridge, which, towards the clypeus, diverges on either side. Pronotum narrow anteriorly, dilated above the insertion of the wings, produced posteriorly into a long pointed process, not reaching beyond the posterior knees, with the median ridge considerably elevated, making the pronotum tectiform, generally with a black spot on either side behind the broadest part. Lateral flaps of the pronotum bilobed at the posterior margin (one-lobed in the immature insect). Elytra lateral, short, lobiform, coriaceous. Wings as long as the process of the pronotum in ♂, much shorter in ♀. Posterior femora robust, with sharp, straight ridges. Prosternum produced anteriorly, surrounding the mouth parts. Abdomen, above compressed, below flat, with two longitudinal ridges. Valves of the ovipositor rugose, denticulate.

Length, 7·5—11 mm.

Brunner says this species is found over nearly the whole of Europe, chiefly in the north and middle. I have it from several British localities. It should be looked for in dry places in woods, fields, and under dead leaves, and probably will be found plentiful and widely distributed.

Fieber figured and described the larva of *bipunctatus* as a new species (*Schrankii*), depending chiefly on the one-lobed posterior margin of the side flaps of the pronotum; but, as Brunner (*op. cit.*, p. 237) points out, this is a character of all the species in their immature stage. Dr. Buchanan White recorded *Schrankii*, Fieb., from Scotland in 1870 (*vide* Ent. Mo. Mag., viii, p. 25).

2.—*TETTIX SUBULATUS*, Linné.

Gryllus subulatus, Linné, Syst. Nat., i, 2, p. 693.

Acrydium subulatum, Curtis, Brit. Ent., x, pl. 439; Steph., Mandib., vi, p. 34.

Acridium subulatum, pallescens, marginatum, humerale, dorsale (Thunberg), *bimaculatum* (Herbst, Fuessly), Zett., Orth. Suec., pp. 109—114; Steph., Mandib., vi, p. 34.

Tettix subulata, Fischer, Orth. Eur., p. 421, tab. xviii, figs. 17, 17*, 17**, 17***; Brunner, Prod. der Eur. Orth., p. 273, fig. 56 C.

Differs as follows from *T. bipunctatus*:—form less robust, frons (seen from above) produced somewhat between the antennæ. Pronotum flatter, with the median ridge but slightly elevated, and that chiefly anteriorly, with the process reaching considerably beyond the posterior knees. Wings as long as the process of the pronotum. Posterior femora more slender. Length, 10—13 mm.

This species will also, I think, be found fairly common. I took it plentifully at the end of September, 1887, on a landslip near Charmouth, Dorsetshire (*vide* Proc. Ent. Soc. Lond., 1887, p. 50). Sweeping seems to be the best method of taking the species of *Tettix*.

(To be continued.)

On breeding Deilephila galii.—It is usual, I believe, to force the pupæ of this insect, but it would seem that this may in some cases very well be dispensed with.

Two gentlemen, who last year took pupæ near Aldborough, Suffolk, and did not force them, send me the following as the result of their experience:—One, N. F. Hele, Esq., F.C.S., of Aldborough, had about twenty pupæ; the other, the Rev. R. Peek, Rector of Swefling, had fourteen pupæ. From the twenty pupæ, thirteen moths emerged in June and July. Mr. Hele writes: "I kept the pupæ in sand, covered with moss, in a cool room; there was no forcing whatever." Of the fourteen pupæ, two were ichneumonised, one produced a cripple, and nine proved perfect; they emerged during the last fortnight in June, and the first week in July. Mr. Peek says, "I kept the pupæ in an aquarium on their original sand from the sea-shore, covered over with moss, and the only forcing I used was a tepid bath once a fortnight, or when they looked dry." Mr. Hele adds, that about 150 larvæ fell to the lot of himself and two friends, but that when, in the early part of October, there were some frosty mornings, the mortality among the larvæ was great.

From the two ichneumonised pupæ mentioned above, three very handsome insects were bred: from one, *Trogus exaltatorius*, Panz., from the other, two specimens of *Amblyteles proteus*, Christ. These are among the largest British Ichneumons, and are both well-known parasites on the *Sphingidæ*; but I do not know whether they have been recorded as bred from *D. galii*.—E. N. BLOOMFIELD, Guestling: October 12th, 1889.

Pterophorus isodactylus in South Dorset.—On August 30th last, I had the pleasure of taking three specimens—two much worn, but one in magnificent condition—of this uncommon plume-moth in a water-meadow in the neighbourhood of Wareham. The only previous record of its occurrence in this county is as follows:—"Taken by J. C. Dale, on June 18th, 1836."—EUSTACE R. BANKES, The Rectory, Corfe Castle, Dorset: October 22nd, 1889.

Choreutes vibrana in the Isle of Purbeck.—On the evening of September 14th last, I had the good fortune to net a nice specimen of the very rare *C. vibrana* as it flew past me over a field of mixed herbage just at dusk. There was no *Inula*—which is given as its food-plant in the “Manual”—close to the spot, but Sorhagen, in his “Kleinschmetterlinge der Mark Brandenburg,” mentions that it also feeds on *Inula salicina*, *I. Helenium*, *Eryngium spina-alba*, *Carlina acaulis*, and *Carduus crispus*; and the last-named plant was certainly growing there. This insect has only once previously occurred in Dorsetshire: a single specimen having been taken at Glanville’s Wootton by the late Mr. J. C. Dale, on August 26th, 1846.—ID.

Sphinx convolvuli at West Lulworth.—During the first week of September, I received two specimens of this fine hawk-moth, both of which had been taken at West Lulworth. Unfortunately, they were both much rubbed and damaged by the time they reached my hands.—ID.

Sphinx convolvuli at King’s Lynn.—Two years ago, the record of a single *convolvuli* seemed almost a joke, the species was so common, but in 1888, not a single specimen was seen, though the White Tobacco blossomed abundantly. This season, however, one specimen of *convolvuli* made its appearance on several successive evenings. Being alone, it was very shy, but at last one of the lads brought it in. It was a female, in good condition, and was, I think, the only one seen in the neighbourhood.—C. G. BARRETT, King’s Lynn, Norfolk: November 11th, 1889.

A destroyer of larvæ of Zeuzera æsculi.—About three weeks ago, a greater-spotted woodpecker (*Picus major*) was shot in the outskirts of Lynn, and was brought to my friend Dr. Plowright. He had the curiosity to dissect out its stomach, and finding the contents interesting, brought them to me. The stomach was very small, and was nearly filled by two half-grown larvæ of the Wood Leopard Moth (*Zeuzera æsculi*), each of which the bird must have extracted with much difficulty from one of the smaller branches of some tree. The Wood Leopard is a rare moth at Lynn—as in many other country places—though rather common in London, and it seems highly probable that this scarcity may be in part due to the evident *penchant* of this woodpecker for its larvæ, and its greater abundance in London parks and squares to the absence of the bird.—ID.

Larvæ of Boarmia rhomboidaria on Scotch fir.—In the springs of this and last year, I took single larvæ of what turned out to be this species, feeding on Scotch fir. They were reared on the same food, and emerged as dwarfed specimens of the var. *perfumaria*. From the strange food-plant, and divergence of the imagines from the type, I failed to identify them, and therefore sent them to Mr. Chas. G. Barrett, who kindly named them for me.—C. J. WAINWRIGHT, Hull Road, Handsworth, Birmingham: November, 1888.

[The two specimens submitted to me were curious varieties—both very smoky, the larger about two-thirds of the ordinary size, the other not more than one-third. In the larger the markings of *rhomboidaria* were visible, particularly the convergence of the two transverse lines towards the dorsal margin, but in the smaller specimen no markings were distinctly visible.—C. G. B.]

Ecophora stipella: the food of its larva.—As I now know of several localities in this county where this species occurs, I think it might possibly be found to be more widely distributed than is at present supposed, were it looked for in the right direction. Mr. Stainton, in his Manual, says that the larvæ feed “under the bark of dead fir trees,” and as several of my correspondents have recently repeated this statement to me, it would appear still to be the prevalent opinion. My experience of the species, however, leads me to think this statement quite erroneous. I take the moths at rest on the trunks of *Sycamore* trees, and the larvæ evidently feed under the bark of these trees, as the presence of quantities of frass would suggest. I have this year also bred several imagines from pupæ taken *in situ*, spun up within a slender web upon the inside of pieces of bark which I had torn from the trees; and as in the locality nearest Perth, where most of my specimens come from, there is not a fir tree, living or dead, within a mile or so, I am sure I am safe in saying the *Sycamore* is here its food.—S. T. ELLISON, Perth: *October 10th*, 1889.

Note on Nabis limbatus.—On 1st September last, feeling a sharp sting on my neck, I hastily put up my hand to catch the offender, when, instead of a wasp, it proved to be a *Nabis limbatus*. The sensation was precisely that of a wasp’s sting, and the appearance also. The swelling, however, was not nearly so great, and in two hours both it and the irritation had subsided. The insect, I imagine, had been trapped between my neck and shirt collar, and had resorted to its rostrum as a weapon of defence.—JAS. EARDLEY-MASON, Alford, Lincoln: *October 17th*, 1889.

Lygus visicola, Puton.—I sent some of the specimens I received from Dr. Chapman (*cf.*, p. 396, *ante*) to Dr. Puton, and he confirms my identification of the species as his *Lygus visicola*: this is satisfactory. His description, published last year, was made from specimens taken near Paris; this year, on September 17th, he obtained some from mistletoe at Remiremont. I see that I have a mutilated example taken from mistletoe by Mr. Dale in Dorsetshire, sent to me in 1881, but not identified; and Mr. James Edwards writes that he finds he has two specimens which he took from mistletoe at East Carlton, near Norwich, on August 22nd, 1878, but had not determined. Thus, as the species has been found at places so far apart as Paris, Remiremont, Dorset, Hereford and Norwich, it is very probable that it exists wherever mistletoe grows. *Sthenarus visci*, Puton (*cf.*, p. 256, *ante*), Dr. Puton informs me has not been seen since its discovery near Paris. Can it not be found in England?—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: *October 7th*, 1889.

Homalium septentrionis, Thoms., in *Warwickshire*.—During the current year I captured several examples of a *Homalium* which struck me as being different from anything I had seen before, and I accordingly put them aside for further examination. It now seems to me that they are clearly referable to the *H. septentrionis* of Thomson. I notice that the antennæ are shorter than in the allied species, and are entirely reddish in colour, the five basal joints being clear and the apical ones slightly dusky. The sculpturation (alutaceous) of the abdomen is also different from that of *H. rivulare*, the punctuation of the elytra is finer and more wrinkled, and the whole insect more parallel. For these reasons I cannot agree with Canon Fowler’s suggestion that this beetle may probably be only a northern variety of *H. rivulare*.

My specimens were taken at Knowle, from May until November, in a mossy bank, in hot beds, and under dead moles. During the same period and under similar conditions I also took *Homalium Allardi* and *H. exiguum*.—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham: November 12th, 1889.

Amara nitida, Sturm, a Warwickshire insect.—Canon Fowler states in his recent work that he had received specimens of an *Amara* from Warwickshire which appeared to belong to this species. It would be interesting to know the exact locality from which they came. Until this week I was under the impression that my capture of this beetle was the first in this county. In the spring of this year I found two or three examples of *A. nitida* in a mossy bank at Knowle, and on the 5th inst. I turned out a splendid ♂ from the same spot. It is not unlikely that *A. nitida* has been found in other places than those already recorded, but that it has been confused with other species; this is the more likely, as many collectors find great difficulty in differentiating the species of this genus.—ID.

BIRMINGHAM ENTOMOLOGICAL SOCIETY: Oct. 21st, 1889.—W. G. BLATCH, Esq., President, in the Chair.

Mr. G. H. Kenrick showed *Arctia Caia* from a second brood which he had reared this year. Mr. C. J. Wainwright showed *Euperia fulvago*, from Sherwood Forest, &c. Rev. Chas. F. Thorneill read a paper on "A fortnight's collecting in Wicken Fen;" describing the best methods of collecting there, and giving a list of species taken.

November 4th, 1889.—The President in the Chair.

Mr. C. J. Wainwright showed *Boarmia rhomboidaria*, var. *perfumaria*, bred from larvæ found on Scotch fir. Mr. H. M. Lee showed *Hypsipetes trifasciata* from Sutton. Mr. H. Tunaley showed *Gonoptera libatrix* which he had taken on over-ripe blackberries at night. Mr. R. C. Bradley showed *Fumea intermediella* from Wyre Forest. Rev. Chas. F. Thorneill showed *Epunda lichenea* from Devonshire. The males were browner than the females. Mr. G. H. Kenrick read a paper on "The White Butterflies of the World," and showed twelve cases of specimens explanatory of same. He attempted a natural classification of the group, based on the theory of descent. At the close of the paper considerable discussion took place, in which Messrs. Neville Chamberlain, W. G. Blatch, C. F. Thorneill, and C. J. Wainwright joined.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: October 24th, 1889.—T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Mr. J. J. Weir exhibited a specimen of *Pieris rapæ* which he had recently captured at Beckenham, and remarked that stragglers of this species had been on the wing very late in the season this year.* Mr. Wellman, bred examples of second brood of *Acidalia marginipunctata*, Göze. Mr. R. Adkin, *Retinia resinella*, L., with pupæ, &c., and contributed notes. Mr. W. West, *Gordius aquaticus*, and read notes thereon. Exhibits were also made by Messrs. Auld, Fremlin, Mera, Manger, Moore,

* I saw *P. rapæ* flying in my garden in the last week in October, when there was a strong cold wind and little sunshine.—R. McLACHLAN.

Adye, Ince, Tugwell, and by Mr. Billups on behalf of the Rev. W. F. Johnson and G. G. Grapes—H. W. BARKER, *Hon. Sec.*

THE ANNUAL EXHIBITION was held at the Bridge House Hotel on Wednesday and Thursday, October 30th and 31st. There was a large attendance, and many interesting exhibitions in subjects outside Entomology, and about thirty microscopes, and a large quantity of living Fungi; on the two evenings 2000 visitors were present. Mr. H. Burns exhibited his living Ants and their nests. *Hymenoptera*, *Hemiptera*, *Diptera* and *Neuroptera* were exhibited by Miss Kimber, and Messrs. Billups, Robinson, and McLachlan. In *Orthoptera*, Mr. Shaw exhibited the British species of *Pachytylus*, and Mr. Billups a living Mole-Cricket. *Coleoptera* were exhibited by Messrs. Billups, Goodman, West, and the Rev. W. F. Johnson. In foreign *Lepidoptera*, were exhibits by Messrs. Leech, (Palæarctic *Catocalæ*), S. Edwards, Dannatt, Jones, Weir, &c. The exhibitions of British *Lepidoptera* were very numerous, and the subjects of great interest. In this department the following (amongst others) assisted, viz.:—Mrs. Hutchinson, Messrs. Briggs, Croker, Adkin, Vine, Wellman, Clarke, Elisha, Machin, Schooling, C. B. Smith, Tutt, Barren, Adye, West, Tugwell, and Jäger.

[The above is abridged from the official report kindly furnished by the Hon. Sec. The requirements of an unusually heavy Index Number do not permit of the report being given in greater detail.—EDS.]

ENTOMOLOGICAL SOCIETY OF LONDON: *November 6th*, 1889.—Prof. J. O. WESTWOOD, M.A., F.L.S., Hon. Life-President, in the Chair.

Mr. Richard S. Standen, of Framlingham Earl Hall, Norwich, was elected a Fellow.

Mr. J. W. Douglas sent for exhibition specimens of *Anthocoris visci*, Doug., a new species taken from mistletoe, at Hereford, in the end of September last by Dr. T. A. Chapman; also specimens of *Psylla visci*, Curtis, taken at the same time and place.

Mr. R. McLachlan exhibited coloured drawings of a specimen of *Zygæna filipendulæ*, in which the left posterior leg is replaced by a fully-developed wing, similar to an ordinary hind-wing, and with the neuration almost precisely the same, but less densely clothed with scales. The specimen was described by Mr. N. M. Richardson in the Ent. Mo. Mag. for June, 1889, and the drawing was executed by Mrs. Richardson. He also exhibited a female specimen of the common earwig, *Forficula auricularia*, with a parasitic *Gordius* emerging from between the metathorax and abdomen. It had been placed in his hands by Mr. A. B. Farn, by whom it was taken.

Mr. W. F. Kirby exhibited a gynandromorphous specimen of *Lycæna Icarus*, having the characters of a male in the right wings and the characters of a female in the left wings, caught by Mr. T. Brown at Keyingham, Yorkshire, on the 22nd June last; also a specimen of a variety of *Crabro interruptus*, De Geer, found by Mr. F. Woodbridge at Uxbridge.

Mr. W. L. Distant exhibited a male and female specimen of a species belonging to a new genus of *Discocephalinæ*, from Guatemala, in which the sexes are totally dissimilar, the female having abbreviated membranes, and being altogether larger than the male.

Dr. D. Sharp stated he had observed that in the *Ipsinæ* division of *Nitidulidæ* there was present a stridulating organ in a position in which he had not noticed it in any other *Coleoptera*, viz., on the summit of the back of the head. He had found it to exist not only in the species of *Ips* and *Cryptarcha*, but also in other genera of the subfamily; on the other hand, he could not find any other trace of its existence, except in members of the *Ipsinæ*. Dr. Sharp also exhibited a box of *Rhynchota*, chiefly *Pentatomidæ*, in which the specimens were prepared so as to display the peculiarities of the terminal segment of the male sex.

Mr. R. Adkin exhibited, on behalf of Mr. H. Murray, of Carnforth, a fine series of *Polia xanthomista*, var. *nigrocincta*, from the Isle of Man, and *Cidaria reticulata* and *Emmelesia taniata* from the Lake District.

Mr. W. White exhibited a living larva of *Zeuzera æsculi*, and called attention to the chitinous scutum or thoracic segments with several rows of minute serrations, which evidently assist progression. He stated that the larva exudes from its mouth, when irritated, a colourless fluid, which he had tested with litmus paper and found to be strongly alkaline. Prof. Westwood made some remarks on the subject.

Mr. H. J. Elwes exhibited a number of insects of various Orders, part of the collection formed by the late Otto Möller, of Darjeeling.

Mons. A. Wailly exhibited the cocoon of an unknown species of *Antheræa* from Assam; also a number of cocoons and imagoes of *Anophe venata* from Acugua, near the Gold Coast, West Africa; specimens of *Lasiocampa otus*, a South European species, which was said to have been utilized by the Romans in the manufacture of silk; also a quantity of nests containing the eggs of *Epeira madagascariensis*, a silk-producing spider from Madagascar, locally known by the name of "Halabe."

Mr. H. Goss read a communication received from Mr. S. H. Scudder, of Cambridge, Mass., U.S.A., on the subject of his recent discoveries of some thousands of fossil insects, chiefly *Coleoptera*, in Florissant, Western Colorado, and Wyoming. Prof. Westwood remarked on the extreme rarity of fossil *Lepidoptera*, and called attention to a recent paper by Mr. A. G. Butler, in the Proc. Zool. Soc., 1889, in which the author described a new genus of fossil moths belonging to the Geometrid family *Euschemidæ*, from a specimen obtained by Mr. A'Court Smith, at Gurnet Bay, Isle of Wight.

Mr. F. P. Pascoe, read a paper, entitled "Additional Notes on the genus *Hilapus*," and exhibited a number of new species belonging to that genus.

The Rev. Dr. Walker read a paper, entitled "Notes on the Entomology of Iceland." Mr. Roland Trimen asked if any butterflies had been found. Dr. Walker said that neither he nor Mr. P. B. Mason had seen any during their recent visit to Iceland, nor were any species given in Dr. Staudinger's list. In reply to a question by Mr. G. C. Champion, Mr. Mason said that during his recent visit to Iceland he had collected nearly one hundred species of insects, including about twenty *Coleoptera*. He added that several of the species had not been recorded either by Dr. Staudinger or Dr. Walker. Mr. Elwes enquired if Mr. J. J. Walker, with his great experience as a collector in all parts of the world, was aware of any land except Iceland, outside the Arctic Circle, from which no butterflies had been recorded. Mr. J. J. Walker replied that the only place in the world which he had visited in which butterflies were entirely absent was Pitcairn Island.—H. Goss, *Hon. Secretary*.

	PAGE
<i>Anthomyia</i> Marshami, Stephens	211
Anthomyiidae, Second Supplement to Annotated List of British ...	393, 424, 448
<i>Antithesia ustulana</i> , Haw., = <i>fuligana</i> , Hüb., Note on the larva of ..	92
Ants from Gibraltar and Tangier, On a collection of ...	17
Ants'-nest Beetles, Notes on, at Gibraltar and Tangier: with special reference to the <i>Histeridae</i>	374
<i>Apanteles ferrugineus</i> , Reinh.	67
„ <i>hoplites</i> , Rtzb., in Britain	282
<i>Apatania muliebris</i> , McLach., The metamorphosis of; a chapter in Parthenogenesis	241
<i>Arctia</i> Caja	161
„ <i>mendica</i> , Variation in	39
<i>Argynnis Paphia</i> (var. <i>valezina</i>) near Reading, Occurrence of	107
<i>Argyrolepis zephyrana</i> , Tr., Note on	15
Ash-flower-gall inquiline, Another	186
Asymmetry in insects	382
“Australian Lepidoptera and their transformations,” Continuation of the late Mr. A. W. Scott's	307
Autumnal Lepidoptera, The scarceness of	162
<i>Bactra furfurana</i> in Norfolk	238
<i>Baris cupirostris</i> , Fabr., &c., at Calais ..	37
“Beiträge zur Kenntniss der schweizerischen Trichopteren, by Fr. Ris:” Review	327
Birmingham Entomological Society	285, 310, 328, 386, 403, 436, 458
Black variety of <i>Limenitis sibylla</i> , The	360
<i>Boarmia repandata</i> , Melanism in	161
Bond, Death of Frederick, F.Z.S., F.E.S.	384
<i>Brachycentrus subnubilus</i> clustered on the under-side of leaves of <i>Symphytum officinale</i>	308
Breeding <i>Deilephila galii</i> , On	455
British and Exotic Coccidae, Notes on some	57, 86, 124, 150, 232, 314
„ <i>Diptera</i>	67
„ <i>Ephemeridae</i> , A concise general synopsis, with an annotated list of the species of ..	9, 29
„ <i>Hemiptera</i> , Addition to the list of	34, 78
„ „ Notes on, the British species of <i>Scolopostethus</i> , &c. ..	148
„ <i>Lepidoptera</i> , Prices of	283
„ <i>Micro-Lepidoptera</i> , On the habits, &c., of certain	171
„ <i>Orthoptera</i> , Synopsis of the	354, 365, 409
„ species of the genus <i>Cixius</i> , On the	100
„ „ „ „ <i>Anaspis</i> , Geoffr., On the, with description of a new species	331
„ „ „ „ The, of <i>Scolopostethus</i>	278
„ <i>Tipulidae</i> , &c. (“Daddy Long-legs”), with notes, List of	20, 97
<i>Butalis laminella</i> , H.-S., Description of the larva of	16
„ „ „ new to Britain, Occurrence in Sussex of	15
Butterflies captured by Mr. C. M. Woodford in the Solomon Islands, Descriptions of new species of... ..	299
„ „ „ Climatic and Local variation in our	79
“ „ „ of North America, by W. H. Edwards:” Review	71, 263, 385
„ „ „ the genus <i>Vanessa</i> , Sounds produced by	268

	iii. PAGE
Byrrhus fasciatus, L., and B. kamtschaticus, Mots., Notes on	432
Callicera ænea	186, 238
Camnula pellucida, var. obiona	164
Capsidæ attacking the Cinchona plantations in Sikkim, Notes on two	271
" , Description of a new species of Neo-tropical	202
Capture of Hadena albifusa, Grote, in Britain	180, 228
Carion beetles attracted by Arum dracunculul	33
" Catálogo de los Coleópteros de Chile, por Federico Phillippi : " Review	70
" Catalogue raisonné des Orthoptères et des Névroptères de Belgique ; par E. de Selys-Longchamps : " Review	165
" " " et synonymique des Névroptères, observés dans les Pays Bas, et dans les pays limitrophes ; par Herman Albarda ; " Review	402
Catephia alchymista	91
" " , Schiff., at St. Leonard's	65
Cateremna terebrella, Zk., On the habits of	109
(") " near Lynn, Re-occurrence of Epischnia	399
Cathormiocerus socius and maritimus : an Entomological Comedy of Errors	121
Catocala fraxini and C. sponsa at Winchelsea	399
Cecidomyia (Diplosis) pyrivora, Riley, Ravages of	323
Cenoloba, Wlsm., On the genus	372
Cerostoma, Latr., and its allies, On the variation of the apical veins in the genus	153
Ceuthorrhynchus, Germar, Notes on certain species belonging to the genus..	200
Charops decipiens, Gr., Pezomachus corruptor, F., ♂, ♀, and	185
Chauliodus insecurellus in Wilts	361
" " , Time of appearance of	400
Chimarra, On the position of	262
Chionaspis fraxini, Sign. (Ch. salicis, Linn.), The male of	436
Chærocampa celerio at Reading	107
Choreutes vibrana in the Isle of Purbeck	456
Chrysoclista bimaculella	91
" " : its variability in markings and size	169
Chrysopa tenella, &c., in West Yorkshire	132
Cixius, On the British species of the genus	100
Climatic and Local variation in our Butterflies	79
Coccidæ, Notes on some British and Exotic	57, 86, 124, 150, 232, 314
" Observations on	42, 118, 189, 275, 349
Coccidinae, On the distinction between Lecanidinae, Hemi-Coccidinae, and	405
Coccids on oaks, Enquiry for scales of	277
Coccinella labilis, Muls., attached to the nests of Formica rufa	36
Coccus cacti in Colorado	382
Coccyx distinctana and Grapholitha nigricana, Habits of	137
Coleophora Frischella, L. (= C. trifolii, Curtis), versus C. melilotella, Scott	1
" vulnerariæ, The larva of	381
Coleoptera, Additions to the list of Irish	285
" and Hymenoptera in the Hastings district	164
" at Armagh	18
" " " in 1888	259

	PAGE
Coleoptera at Carlingford	139
„ „ Colorado	164, 186
„ „ Sandown, Isle of Wight... ..	133
„ „ Shooter's Hill, Kent	133
„ „ South Brent	326
„ „ Descriptions of some new species of Phytophagous	203
„ „ from Japan, Three new species of	297
„ „ in North Devon	325
„ „ Sherwood Forest	401
„ „ the Hastings district	326
Collection of Ants from Gibraltar and Tangier, On a... ..	17
Continental form of <i>Anthocharis cardamines</i>	38
Continuation of the late Mr. A. W. Scott's "Australian Lepidoptera and their transformations"	307
"Contribution towards a Catalogue of the Neuropterous Fauna of Ireland, by J. J. F. X. King:" Review	327
Coreidæ, Descriptions of new species of	230
<i>Corydalis asiatica</i> , Wood-Mason	133
<i>Cosmia affinis</i> , Description of the larva of	298
<i>Cosmopteryx orichalcea</i> , Note on the food-plant of	212
„ „ <i>Schmidiella</i> , Remarkable variety of	307
<i>Crabro leucostoma</i> , L. : its nidification and two parasites	400
<i>Crambus alpinellus</i> in Norfolk	159
„ „ <i>fascinelus</i> , Food-plant of	138
„ „ <i>myellus</i>	431
„ „ <i>ulæ</i> , Cockerell, = <i>C. luteolellus</i> , Clemens	92
<i>Cucujus</i> , On the species of, found in Japan	84
<i>Cyclopides</i> from Chili, A new species of	34
<i>Cynthia Erola</i> , F., Description of the larva and pupa of	37
<i>Dasycampa (Orrhodia) rubiginea</i> at Seaton	284
Dates of appearance of <i>Lycæna Artaxerxes</i>	429
<i>Deilephila galii</i> at Deal	112
„ „ „ Harrogate	91
„ „ „ Note on... ..	111
„ „ „ On breeding	455
„ „ „ on the south east coast of Kent	112
„ „ „ On the probable origin of last year's	284
„ „ „ pupating underground	135
„ „ <i>insidiosa</i> , Erschoff	361
Description of a new <i>Nepticula (fulgens)</i> from beech... ..	12
„ „ „ „ species of <i>Neo-tropical Capsidæ</i>	202
„ „ „ „ species of <i>Epischmia (Bankesiella)</i> new to science, from Portland	63
„ „ „ „ the ash-cauliflower gnat... ..	77
„ „ „ „ larva and pupa of <i>Cynthia Erola</i> , F.	37
„ „ „ „ of <i>Butalis laminella</i> , H.-S.	16
„ „ „ „ „ <i>Cosmia affinis</i>	298
„ „ „ „ „ <i>Euclidia mi</i>	13

	V.
Description of the larva of <i>Homœosoma nimbella</i>	PAGE 245
" " " " " <i>Phalera cadaverina</i> , F.	304
" " " " " <i>Sericoris fuligana</i> , Haw., Stn., <i>abscisana</i> , Dbld. ..	430
" " " " " <i>Tortrix decretana</i>	243
" " " " " <i>Ypsolophus Schmidellus</i> , Heyd. (<i>Nothris dardhamellus</i> , Stn.)	136, 137
" " " larvæ, two species of <i>Ismene</i> from Eastern Africa ...	428
Descriptions of four new species of <i>Typhlocyba</i>	157
" " new species of Butterflies, captured by Mr. C. M. Woodford in the Solomon Islands	299
" " " " " <i>Coreidæ</i>	230
" " several new species of <i>Lycænidæ</i> from West Africa ...	108
" " some " " " <i>Phytophagous Coleoptera</i>	203
" " three " <i>Phytophaga</i> from the East	85
" " " " species of <i>Lepidoptera Heterocera</i>	62
" " two " " <i>Lecanium</i> from Ceylon	248
Destroyer of larvæ of <i>Zeuzera æsculi</i> , A.	456
<i>Diabrotica</i> , Diagnoses of uncharacterized species of	251
<i>Diasemia Ramburialis</i> at Portland	381
<i>Diaspis visci</i> inhabiting mistletoe, Enquiry for	277
<i>Dicyphus constrictus</i> , Boh.	36
Diptera in 1888, Notes on	280
" , Notes on some new and rare British	378
Dipterous destroyer of <i>Icerya Purchasi</i> , The	257
Distinction, On the, between <i>Lecanidinæ</i> , <i>Hemi-Coccidinæ</i> , and <i>Coccidinæ</i> ...	405
Distribution, time of appearance, habits, size, &c., of the genus <i>Selenia</i> ...	38
Double-brooded moths, Effect of the late inclement season on	308
<i>Douglasia ocuerosomella</i> , Larva of	39
Dragon-flies occurring at Deal and Dover, Notes on the	163
<i>Ectobia Panzeri</i> , var. <i>nigripes</i>	398
Effect of the late inclement season on double-brooded moths	308
Enquiry for <i>Diaspis visci</i> inhabiting mistletoe... ..	277
" , scales of Coccids on oaks	277
Entomological notes from Colorado	324, 363
" ramble at Bergen, Norway, August 20th, 1887, Notes on Dr. Jordan's	320
" Society, Birmingham 285, 310, 328, 386, 403, 436, 458	
" " of London 19, 41, 72, 96, 117, 143, 168, 187, 216, 240, 264, 287, 311, 329, 363, 388, 404, 437, 459	
"Entomology for beginners, by A. S. Packard, M.D., Ph.D.:" Review ..	140
Ephemeridæ, A concise general synopsis, with an annotated list of the species of British	9, 29
<i>Epischnia</i> (<i>Banksiella</i>) new to science, from Portland, Description of a new ...	63
" (<i>Cateremna</i>) <i>terebrella</i> , near Lynn, Re-occurrence of	399
<i>Euclidia mi</i> , Description of the larva of	13
<i>Eupithecia extensaria</i> near Hunstanton	398
" " , Note on	258
<i>Eupœcilia dubitana</i> , Hb., New food-plant for	430

	PAGE
Extension of European Lepidoptera to Japan, On the	178
Ferrol, Three days at	389
Fertile eggs laid by workers of <i>Leptothorax tuberum</i> , F.	313
Few words, A, about <i>Acrolepia assectella</i>	291
Flesh flies, On two additional British species of <i>Sarcophagidæ</i> or	27
Food of <i>Gelechia</i> (<i>Cladodes</i>) <i>gerronella</i> , Z., Further hints as to the ..	361
" " " , New, for <i>Eupœcilia dubitana</i> , Hb.	430
" -plant of <i>Cosmopteryx orichalcea</i> , Note on the	212
" " " <i>Crambus fascinelinus</i>	138
" " " <i>Hesperia Actæon</i> in England	283
" " " <i>Thecla rubi</i> , L., On the	15
Forficula, A parasite on	282
" <i>pubescens</i> , Gén��	429
<i>Fumea</i> (?) <i>limulus</i> , Rogenhofer	362
Further hints as to the food of <i>Gelechia</i> (<i>Cladodes</i>) <i>gerronella</i> , Z.	361
<i>Gelechia atrella</i> in <i>Hypericum</i> stems	382
" (<i>Cladodes</i>) <i>gerronella</i> , Z., Further hints as to the food of ..	361
" (<i>Doryphora</i>) <i>servella</i> , Z., bred in a London suburban greenhouse...	361
" (<i>Lamprotes</i>) <i>atrella</i> ?, Has any one lately bred	318
" <i>marmorea</i> , Haw., Note on the food-plant of ..	65
" <i>pelella</i> , Tr., Notes on the larva of	161
Generic Nomenclature in Entomology	265
<i>Gnorimus variabilis</i> , L., in Windsor Forest	400
<i>Gonepteryx rhamni</i> , Where does, hibernate?	92, 135, 158
Gore, Death of Rev. H. J., M.A.	402
Gosse, Death of Philip Henry, F.R.S.	113
<i>Grapholitha nigricana</i> , Habits of <i>Coccyx distinctana</i> and	137
<i>Gyrinus minutus</i> in the South	325
Habits of <i>Cateremna terebrella</i> , Zk., On the'	109
" " <i>Coccyx distinctana</i> and <i>Grapholitha nigricana</i>	137
" " <i>Opostega salaciella</i> , Tr., &c.	145
" &c., of certain British Micro-Lepidoptera, On the	171
<i>Hadena albifusa</i> , Grote, in Britain, Capture of	180, 228
" Handbuch f��r Insekten-Sammler, von Alexander Bau : " Review ..	69
Haworth's Types of British Micro-Lepidoptera, Concerning some of ...	5
Hemi-Coccidina�� and Coccidina��, on the distinction between <i>Lecanidina��</i> , ...	405
Hemiptera, Addition to the list of British	34, 78
" at Ewhurst ..	401
" -Heteroptera in West Cornwall	237
" , Notes on British—the British species of <i>Scolopostethus</i> , &c. ...	148
" on Mistletoe, Two new species of	256
<i>Heptaulacus villosus</i> , Gyll., in profusion in Cobham Park, Kent	325, 359
" " " near Lewes	383
<i>Hercostomus germanus</i> as a British species, Authentication of	214
<i>Hesperia Act��on</i> , Food-plant of, in England	283
Hessian Fly, Our	134
Hispid��, Notes on Japanese	94

Histeridæ, Notes on Ant's-nest beetles at Gibraltar and Tangier; with especial reference to the	374
Holmgrèn, Death of August Emil	309
Holocentropus stagnalis, Albarda, in Ireland	235
Homalium septentrionis, Thoms., in Warwickshire	457
Homœosoma nimbella, Description of the larva of	245
Hylophila prasinana, Sound produced by	257
Hymenoptera at Woking, Rare	131
" in the Hastings district, Coleoptera and	164
" , Rare Aculeate, in 1889... ..	434
Hyponomeuta cognatella, Malformation in	306
Icerya Purchasi, The Dipterous destroyer of	257
Insect Life in Australia, Intermittent development and conditions of	382
"Insect Life, edited by Professor Riley:" Review	166
Insects, Some, common to Europe and Colorado	67, 255, 324
Interbreeding of Zygæna trifolii and Z. filipendulæ, On the	212
Intermittent development and conditions of insect-life in Australia... ..	382
Interpretation of neural structure, On the	175
"Introduction to Entomology, by John Henry Comstock, Professor of Entomology:" Review	165
Irish Coleoptera, Additions to the list of	285
Ischnocoris hemipterus, &c., Macropterous form of	35
Jersey, a week in	49
Kirsch, Death of Theodor	402
(Lamprotes) atrella?, Has any one lately bred Gelechia	318
Larva and pupa of Cynthia Erotæ, F., Description of the	37
" of an Agdistis (adactyla) on Artemisia campestris	39
" , Antithesia ustulana, Haw., = fuligana, Hüb., Note on the	92
" , Butalis laminella, H.-S., Description of the	16
" , Coleophora vulnerariæ, The	381
" , Cosmia affinis, Description of the	298
" , Douglasia ocneros stomella	39
" , Euclidia mi, Description of the	13
" , Gelechia peliella, Tr., Notes on the	161
" , Homœosoma nimbella, Description of the	245
" , Lobesia permixtana, The	66
" , Phaleria cadaverina, Description of the	304
" , Scoparia cembræ, The	126
" , Tortrix decretana, Tr., Description of the	243
" , Ypsolophus Schmidiellus (Nothris Durdhamellus), Description of the	136, 137
" , &c., of Philopotamus, The	89
Larvæ of Boarmia rhomboidaria on Scotch fir	456
" , Lasiocampa rubi, Profusion of	153
" , some Tortrices commonly bred from the galls of Cynips Kollari, &c., Notes on the	217
" , two species of Ismene from Eastern Africa, Description of the	428
Lasiocampa rubi, Profusion of the larvæ of	135

	PAGE
Lecanidineæ, Hemi-Coccidineæ and Coccidineæ, On the distinction between ...	405
Lecanium from Ceylon, Descriptions of two new species of ...	248
Leistotrophus nebulosus in Ireland	239
Lemophlæus pusillus, Schön. ?	261
Lepidoptera at Armagh in 1888	259
" Heterocera, Descriptions of three new species of	62
" in the South of France, Notes on	208
" near Marlborough	184
" , Notes on some very old specimens of	223, 246
" of Norway	362, 439
" , On melanism in	40
Leptothorax tuberosum, F., Fertile eggs laid by workers of	313
Leucaniidæ, Notes on the synonymy of certain British	52
Leucophasia Duponcheli, Note on	212
Libellula quadrimaculata at Dover, Migratory swarm of	324
" " off the Essex Coast, Migratory swarm of	93
Life-history of the second brood of Platyptilia gonodactyla, Notes on the ...	104
Limacodes testudo, Parasites of	438
Limenitis Sibylla, The black variety of	360
Linen injured by Agrotis larvæ	220
List of British Tipulidæ, &c. ("Daddy Long-legs"), with Notes	20, 97
"List of British Diptera, by G. H. Verrall, F.E.S.:" Review	143
Lobesia permixtana, The larva of	66
Lophyrus pini, Ravages of	131
Lopus sulcatus at Torcross	326
Lycæna Alexis, Hb.	103
" Artaxerxes, Dates of appearance of	429
" Cyllarus, Note on	211
" exilis	429
Lycenidæ from West Africa, Descriptions of several new species of	108
Lygus viscidola, Puton, in England	396, 457
Macropterous form of Ischnocoris hemipterus, &c.	35
Malformation in Hyponomeuta cognatella	306
Mecinus circulator, &c., in the Isle of Wight	17
Megacronus cingulatus at Armagh	18
Melanism in Birmingham and South Devon	102
" " Boarmia repandata	161
" " Lepidoptera, On	40
Meloë rugosus, Marsh., at Broadstairs	239
Metamorphoses of Apatania muliebris, McLach.; a chapter in Parthenogenesis	241
Microdus calculator, Fab.	353
Micro-Lepidoptera, Some, of Norfolk	306
Migratory swarms of Libellula quadrimaculata at Dover	324
" " " " off the Essex Coast... ..	93
Molanna palpata, McLach., in Ireland	93
Mytilaspis pomorum	16
Nabis limbatus, Note on	457

" Natural History of Hastings and St. Leonard's and the vicinity. Second Supplement": Review	70
Nepticula (fulgens) from beech, Description of a new	12
Neural structure, On the interpretation of	175
Neuronia clathrata in the London District	67
Neuroptera collected by Mr. J. J. Walker, R.N., on both sides of the Straits of Gibraltar... ..	344
" , Trichoptera and Orthoptera at Deal and neighbourhood	214
New food-plant for Eupœcilia dubitana, Hb.	430
" locality for Potaminus substriatus	360
" species of Teretriosoma, Horn, On a	397
Noctuæ at sugar in Norfolk	305
Noise or sound produced by butterflies of the genus Vanessa, The	225
Nomenclature of Dr. Rudow's new species of Amblyteles, The	36
" , Generic, in Entomology... ..	265
Non-development of a wing in Melitæa	93
Nosodendron from Japan, On a species of	229
Notes from Colorado	324, 363
" on Aculeate Hymenoptera	128
" " Ant's-nest Beetles at Gibraltar and Tangier; with especial reference to the Histeridæ	374
" " certain species belonging to the genus Ceuthorhynchus, Germar	200
" " Diptera in 1888	280
" " Dr. Jordan's Entomological Ramble at Bergen, Norway, August 20th, 1887	320
" " Lepidoptera in the South of France	208
" " Mr. Edwards' paper on Scolopostethus	295
" " Peltastica Reitteri, Lewis, and Rhysodes exaratus, Serv., and on Byrrhus fasciatus, L., and B. kamtschaticus, Mots.	432
" " some British and Exotic Coccidæ 57, 86, 124, 150, 232, 314	
" " new and rare British Diptera	378
" " very old specimens of Lepidoptera	223, 246
" " the larvæ of some Tortrices, commonly bred from the galls of Cynips Kollari, &c.	217
" " probable origin of last year's Deilephila galii	284
" " synonymy of certain British Leucaniidæ	52
" " Tortrix decretana, Tr., with a description of its larva	243
" " two Capsidæ attacking the Cinchona plantations in Sikkim	271
Nothris durdhamellus, Description of the larva of	136, 137
Notodontæ, Note on certain	39
Notoxus monoceros, L., Aberrant specimens of	435
Nyssia zonaria in Co. Antrim	283
Observations on Coccidæ... ..	42, 118, 189, 275, 349
Ocneria dispar, L., near Algeçiras, Abundance of	65
Occurrence in Sussex of Butalis laminella, H.-S., new to Britain	15
" " Worcestershire of Setodes punctata, F., a species of Trichoptera new to Britain	383
" " of Argynnis Paphia (var. Valezina) near Reading	107
Œcophora stipella; its food-plant	457

	PAGE
<i>Oinophila vau-flava</i> , Note on	238
Old specimens of Lepidoptera, Notes on some very	223, 246
<i>Oporabia filigrammaria</i> in Ireland, <i>Phibalapteryx lapidata</i> and	213
<i>Opostega salaciella</i> , Tr., &c., The habits of	145
"Origin of Floral Structures, though Insect and other agencies, by Rev. G. Henslow, M.A., F.L.S., F.G.S.:" Review	141
<i>Orrhodia (Dasyampa) rubiginea</i> at Seaton	284
<i>Orthezia insignis</i> in England, The spreading of	270
Orthoptera at Deal and neighbourhood, Neuroptera, Trichoptera, and	214
" , Synopsis of the British	354, 365, 409
<i>Orthotrichia angustella</i> and its case, Note on	93
<i>Oxyporus rufus</i> , L., in Scotland	37
<i>Oxyptilus pilosellæ</i> , Re-occurrence of, in England, with notes on its nearest allies	431
Parasite on <i>Forficula</i> , A	282
Parasites of <i>Limacodes testudo</i>	433
<i>Parnus nitidulus</i> , Heer, in Devonshire	435
Parthenogenesis, A chapter in; The Metamorphoses of <i>Apatania muliebris</i> , McLach... ..	241
<i>Peltastica Reitteri</i> , Lewis, and <i>Rhysodes exaratus</i> , Serv., and on <i>Byrrhus fasciatus</i> , L., and <i>B. kamtschaticus</i> , Mots., Notes on	432
<i>Pentarthrum Huttoni</i> , Woll., at Plymouth	326
<i>Perileptus (Blemus) areolatus</i> , &c., at Llangollen	37
<i>Pezomachus corruptor</i> , F., ♂, ♀, and <i>Charops decipiens</i> , Gr.	185
<i>Phaleria cadaverina</i> , F., Description of the larva of	304
<i>Phanæus</i> , Macleay, On a hitherto undescribed species of the genus... ..	179, 214
<i>Phibalapteryx lapidata</i> and <i>Oporabia filigrammaria</i> in Ireland	213
" , in Argyllshire	162
<i>Philopotamus</i> , The larva, &c., of	89
<i>Phlæodes Demarniana</i> in Norfolk	259
Phytophaga from the East, Description of three new... ..	85
Phytophagous Coleoptera, Descriptions of some new species of	203
<i>Pimelia</i> , On a new, brought by Mr. Jos. Thomson from Morocco	255
<i>Platyptilia gonodactyla</i> , Notes on the Life-history of the second brood of	104
" , (trigonodactylus), On the variation in the early stages of	105
<i>Plusia ni</i> in Dorset	160
" , , Portland	184
Position of <i>Chimarra</i> , On the	262
<i>Potaminus substriatus</i> , A new locality for	360
Prays <i>Curtisellus</i> and <i>rustica</i> , Notes on	73
Prices of British Lepidoptera	283
<i>Prionocyphon serricornis</i> , &c., at Mickleham	134
Proceedings of the Entomological Society of London ... 19, 41, 72, 96, 117, 143, 163, 187, 216, 240, 264, 287, 311, 329, 363, 388, 404, 437, 459	
Profusion of larvæ of <i>Lasiocampa rubi</i>	135
Protective resemblance in larva of <i>Stauropus fagi</i>	107
<i>Psocus obscurus</i> , Rambur, Note on	210
<i>Pterophorus heterodactylus</i> , Haworth, and <i>Scoparia gracilalis</i> , Doubleday	162
" , <i>isodactylus</i> in South Dorset	465

	xi. PAGE
Puls, Death of Jacques Charles	262
Rare Aculeate Hymenoptera in 1889	434
Ravages of <i>Cecidomyia</i> (<i>Diplosis</i>) <i>pyrivora</i> , Riley	323
„ „ <i>Lophyrus pini</i>	131
Rejoinder on <i>Retinia posticana</i> , A	196
Remarkable variety of <i>Cosmopteryx schmidiella</i>	307
Remarks on Mr. Jas. Edwards' List of Norfolk Hemiptera	446
Re-occurrence of <i>Epischia</i> (<i>Cateremna</i>) <i>terebrella</i> near Lynn	399
„ „ <i>Oxyptilus pilosellæ</i> in England, with notes on its nearest allies	431
„ „ <i>Tortrix piceana</i> , L., in Britain	139
“Répertoire alphabétique des noms spécifiques admis ou proposés dans la sous-famille des Libellulines, par A. Preudhomme de Borre:” Review	328
“Report of the Entomologist, C. V. Riley, M.A., Ph.D. for the year 1888:”	385
<i>Retinia posticana</i> , Zett., a new British <i>Tortrix</i>	146, 181, 196
„ „ „ bred	307
“Revisio Synonymica Heteropterorum Palæarcticorum, quæ descripserunt Auctores vetustiores (Linnaeus, 1758; Latreille, 1806), von O. M. Reuter:” Review	68
<i>Rhysodes exaratus</i> , Serv., Notes on <i>Peltastica Reitteri</i> , Lewis, and on <i>Byrrhus fasciatus</i> , L., and <i>B. kamtschaticus</i> , Mots.	432
Salda, Aquatic habits of	237
Sarcophagidæ, or Flesh-flies, On two additional British species of	27
Scarceness of autumnal Lepidoptera, The	162
<i>Scolopostethus adjunctus</i> , D. & S., On	380
„ „ Notes on Mr. Edwards' paper on	297
„ „ The British species of	148, 278
<i>Scoparia cembræ</i> , The larva of	126
„ <i>gracilis</i>	162, 185
Scott, Death of John	114
Second Supplement to Annotated List of British Anthomyiidæ	393, 424, 448
<i>Selenia</i> , Distribution, time of appearance, habits, size, &c., of the genus	38
<i>Sericoris fuligana</i> , Haw., <i>Stn.</i> , <i>abscisana</i> , Dbld., Description of the larva of... ..	430
<i>Setodes punctata</i> , F., Occurrence in Worcestershire of a species of <i>Trichoptera</i> new to Britain	383
Signoret, Death of Dr. Victor	309
<i>Sipalia testacea</i> at Plymouth	214
<i>Sirex gigas</i> at Armagh	132
Sound produced by <i>Hylophila prasinana</i>	257
Sounds „ „ Butterflies of the genus <i>Vanessa</i>	268
South London Entomological and Natural History Society	18, 40, 71, 95, 116, 166, 187, 215, 239, 263, 286, 310, 329, 386, 403, 436, 458
<i>Sphecodes parasitic</i> ?, Is... ..	206
<i>Sphinx convolvuli</i> at King's Lynn	456
„ „ „ West Lulworth	456
„ <i>ligustri</i> in the North Sea	111
„ <i>pinastri</i> near Wimbledon	159
Spreading of <i>Orthezia insignis</i> in England, The	270
<i>Spudastica petiolaris</i> , Thomson	163
<i>Stenobothrus rufipes</i> , Zett.	429

Stenophylax stellatus and <i>S. latipennis</i> , Note on	235
Stylops, <i>Andrena</i> and	293
„ <i>melittæ</i> on the wing near Woking	36
Substitution of a wing for a leg in <i>Zygæna filipendulæ</i> , and notes on the yellow variety of that species	289
Supposed new British Tortrix, On the, <i>Retinia posticana</i>	181, 196
Synonymy of certain British Leucaniidæ, Notes on the	52
Synopsis, A concise general, with an annotated list of the species of British Ephemeriidæ	9, 29
“ „ of the Aphididæ of Minnesota, by O. W. Oestlund:” Review	94
„ „ „ British Orthoptera	354, 365, 409, 450
Teretriosoma, Horn, On a new species of	397
Thecla Alcestis	382
„ <i>rubi</i> , L., On the food-plant of	15
„ „ „ Variety of	306
„ <i>w-album</i> at King's Lynn	137
„ „ in Norfolk	159
Three days at Ferrol	389
„ new species of Coleoptera from Japan	297
Time of appearance of <i>Chauliodus insecurellus</i>	400
<i>Tinea pallescentella</i> in Birmingham	213
<i>Tinodes maculicornis</i> at Athlone	283
Tipulidæ, &c. (“Daddy Long-legs”), with notes, List of British	20, 97
Tortrices, Note on the larvæ of some, commonly bred from the galls of <i>Cynips Kollari</i> , &c.	217
Tortrix <i>decretana</i> , Tr., Notes on, with a description of its larva	243
„ <i>piceana</i> , L., in Britain, Re-occurrence of	139
„ „ „ „ Surrey	160
Trichoptera and Orthoptera at Deal and neighbourhood, Neuroptera,	214
„ collected in Iceland by Mr. P. B. Mason in the summer of 1889	421
„ new to the British List, Two species of	235
„ , Notes on <i>Agrypnia pagetana</i> and other...	323
<i>Trifurcula pallidella</i> in the Isle of Purbeck	445
<i>Triphosa dubitata</i> , Note on	136
Two new species of Hemiptera on mistletoe	256
<i>Typhlocyba</i> , Descriptions of four new species of	157
<i>Vanessa</i> , The noise or sound produced by Butterflies of the genus	225, 268
„ <i>Antiope</i> at Barcombe, Sussex, at Beckenham, at Guestling	429
„ „ in Kent	113
„ „ „ the Isle of Wight...	91
Variation in <i>Arctia mendica</i>	39
„ „ our Butterflies, Climatic and local	79
„ „ the early stages of <i>Platyptilia gonodactyla</i> (<i>trigonodactylus</i>), On the	105
„ of the apical veins in the genus <i>Cerostoma</i> , Latr., and its allies, On the	153
Variations of <i>Agrotis cursoria</i>	138
Variety of <i>Cosmopteryx schmidiella</i> , Remarkable	307
„ „ <i>Limenitis sibylla</i> , The black	360
„ „ <i>Thecla rubi</i>	306

	xiii.
	PAGE
Week in Jersey, A	49
Whirlwind, The, as a distributing agent	308
Wing for a leg, Substitution of a, in <i>Zygæna filipendulæ</i> , and notes on the yellow variety of that species	289
Wood, Death of Rev. John George, M.A.	262
Workers of <i>Leptothorax tuborum</i> , F., Fertile eggs laid by	313
<i>Xanthia cerago</i> and silago	247
<i>Ypsolophus Schmidiellus</i> , Heyd. (<i>Nothris durdhamellus</i> , Stn.), Description of the larva of	136, 137
<i>Zeuzera æsculi</i> , A destroyer of larvæ of	456
<i>Zygæna filipendulæ</i> , Substitution of a wing for a leg in, and notes on the yellow variety of that species	289
„ <i>trifolii</i> and <i>Z. filipendulæ</i> , On the interbreeding of	212

INDEX OF SUBJECTS NOTICED IN THE PROCEEDINGS OF THE ENTOMOLOGICAL SOCIETY OF LONDON.

	PAGE
<i>Acidalia immorata</i> , L., from Lewes	168
<i>Acrolepia assectella</i> , Z., new to Britain	329
<i>Acronycta ligustri</i> , Variety of	404
<i>Adinonia tanaceti</i> , Larvæ of	72
<i>Æschna borealis</i> , Remarks on	288
<i>Agapanthia lineatocollis</i> , Don., Stridulation of	288
<i>Agriotypus armatus</i> , Curt., Life-history of	364
<i>Agrotis pyrophila</i> , Varieties of	288
„ <i>segetum</i> , Variety of	144
Amazons, <i>Pyralidina</i> from the	240
<i>Amblytylus delicatus</i> new to Britain	117
Annual Meeting, The Fifty-sixth	216
<i>Anochetus Ghilianii</i> from Tangier	96
<i>Anthocharis</i> , The <i>Charlonia</i> group of	404
<i>Anthocoris visci</i> , Dgl., n. sp.	459
Ant Lions, Bred specimens of	168
Ants, Indian	288
„ Nests of living	312
<i>Aphodius</i> , British species of	19
<i>Arctia mendica</i> , Varieties of	72, 364
<i>Argynnis</i> , Neuration of	438
„ <i>Niobe</i> and <i>Pales</i> , Melanic forms of	188
„ , Remarks on the genus	404
Assam, <i>Lepidoptera</i> from	188
<i>Aulacophora</i> , New species of	240
<i>Barynotus obscurus</i> , Probable variety of	288
<i>Boarmia repandata</i> , Varieties of	240
<i>Brachycerus</i> , Species of	96
Brittany, <i>Coleoptera</i> from	42
Burmah, „ „	312
„ <i>Lepidoptera</i> from	330, 364
Butterflies, Desquamated wings of	312
„ from California	144
„ „ the Gold Coast	168

Calcutta Museum, Insects of the	...	...	...	...	...	363
California, Butterflies from	...	...	...	...	...	144
Cardiophorus cinereus, Hbst., from Tenby	...	...	...	...	...	388
Catephia alchymista from St. Leonard's	...	...	...	...	...	96
Catocala nupta, Melanic form of	...	...	...	...	...	188
Celebes, Lepidoptera from Northern	...	...	...	...	...	96
Chærocampa nerii from Burton-on-Trent	...	...	...	...	...	143
Chrysomela japona	...	...	...	...	...	19
Chrysophanus, New species of, from Burmah	...	...	...	...	...	364
Cicada from Mexico, with fungoid growth	...	...	...	...	...	144
Cidaria reticulata and its larva	...	...	...	...	...	438
Clisiocampa neustria; the yellow powder of its cocoon	...	...	...	...	...	438
Coccidæ from Natal	...	...	...	...	...	312
Coleophora solitariella and its parasites	...	...	...	...	...	96
Coleoptera and Lepidoptera from Mexico	...	...	...	...	...	96
„ from Brittany	...	...	...	...	...	42
„ „ Burmah	...	...	...	...	...	312
„ „ St. Kilda	...	...	...	...	...	117
„ „ the Isle of Wight	...	...	...	...	...	117, 364
„ „ New Longicorn	...	...	...	...	...	168
„ „ Phytophagous	...	...	...	...	...	72, 438
„ „ Rare British	...	...	...	...	...	364, 438
Cossus ligniperda, White variety of larva of	...	...	...	...	...	264
Crabro interruptus, D. G., Variety of	...	...	...	...	...	459
Crematogaster scutellaris, Oliv., at Burton-on-Trent	...	...	...	...	...	330
Cryptolechidæ, Species of	...	...	...	...	...	144
Cychramus luteus and fungicola the sexes of one species	...	...	...	...	...	404
Darjeeling, Insects from	...	...	...	...	...	460
Delias Seneca, Moore	...	...	...	...	...	288
Diabrotica, New species of	...	...	...	...	...	364
Discocephalinæ, Dissimilarity in the sexes of a species of	...	...	...	...	...	459
Dytiscus, with bivalve shell attached	...	...	...	...	...	168
Endromis versicolor, Larva of	...	...	...	...	...	42
Erebia, The genus	...	...	...	...	...	240
Eretmotus and Hetærius, Species of	...	...	...	...	...	42
Eubolia bipunctaria, Variety of	...	...	...	...	...	19
Eupithecia extensaria, Larvæ of	...	...	...	...	...	264
Eyes of Insects	...	...	...	...	...	330
Fossil Insects	...	...	...	...	...	460
Gibraltar, Lepidoptera from	...	...	...	...	...	329
Glenea, New species of	...	...	...	...	...	240
Gold Coast, Butterflies from the	...	...	...	...	...	168
Gynandromorphous Lycæna Icarus	...	...	...	...	...	459
„ Nephronia Hippia, F.	...	...	...	...	...	404
„ Saturnia carpini	...	...	...	...	...	19
Halticidæ, Destructive species of, from Trinidad	...	...	...	...	...	42
Hawaiian Islands, Pyralidina of the	...	...	...	...	...	19
Hessian Fly	...	...	...	...	42, 72, 117, 168, 330	

	xv.
	PAGE
Hetærius and Eretmotus, Species of	42
Heterogynis paradoxa, Ramb., Structure of	364
Hilipus, New species of	460
Hymenoptera, British parasitic	144
Iceland, Insects from	414, 437, 438, 460
„ Proposed excursion to	264
Ichneumonidæ, Additions to Catalogue of British	312, 364
Indian Ants	288
Ipsinæ, Stridulating organ in	460
Isle of Wight, Coleoptera from the	117, 364
„ „ „ Vanessa Antiopa in the	143
Japan, Neuroptera from	330
„ Rhyncophora from	168
Kiukiang, Lepidoptera from	188
Larvæ as influenced by surroundings	144, 438
Lepidoptera and Coleoptera from Mexico	96
„ , British Micro-	117, 144, 264, 330, 388
„ captured at sea	388
„ from Assam	188
„ „ Burmah	330, 364
„ „ Gibraltar	329
„ „ Kiukiang	188
„ „ Northern Celebes	96
„ of New Guinea	388
„ , The Zellerian Collection of	312
„ Varieties of British	19, 72, 117, 188, 240, 288, 364, 404
Longicorn Coleoptera, New	168
Longicornia, Exotic species of	143
Lophostethus Dumoulini, Guer., Larva of	240
Luminous larva from Hong Kong	388
Lycæna Icarus, Gynandromorphous	459
Luperina Nickerlii, Freyer, in Lancashire	438
Lygus visicola, Puton, new to Britain	437
Mantidæ, Drawings of	41
Mexico, Insects from	96
Micro-Lepidoptera, British	117, 144, 264, 330, 388
Monanthia angustata, H.-S., new to Britain	41
Mycterus curculionoides, L., at Oxford...	188
Natal, Coccidæ from	312
Nephronia Hippiæ, F., Gynandromorphous	404
Neptunides Stanleyi, O. Jans., from Central Africa	330
Neuroptera from Japan	330
Noctuites, Genera of	330
New Guinea, Lepidoptera of	388
„ „ , Rhynchota from	144
Æcodoma cephalotes, Habits of	264
Orgyia thyalina, Females of	264

Ornithoptera Brookiana, Variety of	...	...	...	...	...	188
„ minos, Variety of	...	...	...	...	...	19
„ trojana and Plateni from Palawan	...	...	...	...	...	287
Pacific, Rhopalocera from the Western	...	...	...	...	...	264
Palawan, Ornithoptera from	...	...	...	...	...	287
Palingenia longicauda	...	...	...	...	...	72
Papilio Antimachus	...	...	...	...	...	438
Pedigree moth-breeding	...	...	...	...	...	188
Pellenes tripunctatus, a spider new to Britain	...	...	...	...	...	72
Pentatomidæ, Terminal segments of male of	...	...	...	...	...	460
Phorodesma smaragdaria, Larva of	...	...	...	...	...	42
Photography as applied to illustrations	..	...	...	...	...	188
Phytophagous beetle from Corea, An undetermined	...	...	...	...	...	438
„ Coleoptera	...	...	...	...	...	72
Platymetopius undatus from Ewhurst	...	...	...	...	...	404
Polia xanthomista, var. nigrocincta	...	...	...	...	...	460
Proculus Goryi, Kaup, Structure of	...	...	...	...	...	288
Psylla visci, Curt., from Hereford	...	...	...	...	...	459
Pterophorus Zetterstedtii at Sydenham	...	...	...	...	...	168
Pyrilidina from the Amazons	...	...	...	...	...	240
„ of the Hawaiian Islands	..	...	...	...	...	19
Retinia resinella from Forbes	...	...	...	...	...	438
Rhodia Newara, Cocoon of	..	...	...	...	...	330
Rhomborhina japonica, Abnormal form of	...	...	...	...	...	312
Rhopalocera from the Western Pacific	...	...	...	...	...	264
Rhynchophora from Japan	...	...	...	...	...	168
Rhynchota from New Guinea...	...	...	...	...	...	144
St. Kilda, Coleoptera from	..	...	...	...	...	117
Saturnia carpinii, Gynandromorphous	...	...	...	...	...	19
Scoliidæ, New species of	...	...	...	...	...	364
Silk-producing Lepidoptera and Spiders	...	..	...	...	...	...
Snellenia, Tinægeria, and Eretmocera, Genera connecting	...	...	...	...	...	188
Sternocera from Lake Tanganyika	..	...	...	...	...	188
Stridulating organ in Ipsinæ	...	..	...	...	...	460
Substitution of a wing for a leg in Zygæna filipendulæ	...	...	...	...	...	459
Terias Hecabe, Variations in	...	...	...	...	...	312
Thaumantis Howqua from Shanghai	...	...	...	...	...	312
Theodosia Howiti, Cast., from Borneo	...	...	...	...	...	364
Theridion pallens, Blackw., Nests of	...	...	...	...	...	312
Tinægeria, and Snellenia, The genera connecting with Eretmocera	...	...	...	...	...	188
Tirumala Petiverana	..	...	...	...	...	264
Titubæa sanguinipennis, Lac., Varieties of	...	...	...	...	...	144
Tortrix piceana and Podana	...	...	...	...	...	188
Trichoptera from Iceland	...	...	...	...	...	437
Triphænæ, Varieties of British	...	...	...	...	...	288
Vanessa Antiopa in the Isle of Wight	...	...	...	...	...	143
Varieties of British Lepidoptera	...	19, 72, 117, 188, 240, 288, 364,	404	...	...	...
Vision of Insects	...	...	...	...	...	330
Zellerian Collection of Lepidoptera	...	...	...	...	...	312
Zeuzera æsculi, Structure of larva of	...	...	...	...	...	460
Zygæna filipendulæ with a wing substituted for a leg	...	...	...	...	...	459

SPECIAL INDEX.

COLEOPTERA.

	PAGE		PAGE
<i>Abdera bifasciata</i>	134, 360	<i>Eretmotus tangerianus</i>	374
<i>Abræus granulum</i>	360, 401	<i>Eriirhinus æthiops</i>	259
<i>Acidota crenata</i>	18	<i>Euplectus nubigena</i>	401
<i>Adrastus pusillus</i>	133, 164	<i>Euthia clavata</i> , 401; <i>scydmanoides</i>	134
<i>Aëpus marinus</i> , 134, 214; <i>Robinii</i> ...	134, 214	<i>Gnorimus nobilis</i> , 400; <i>variabilis</i>	400
<i>Agabus congener</i>	139	<i>Gonophora Masoni</i> (sp. n.), Baly	85
<i>Agaricophagus cephalotes</i>	133	<i>Gymnetron villosulum</i>	260, 325
<i>Amara nitida</i>	458	<i>Gyrinus minutus</i> , 325; <i>urinator</i>	325
<i>patricia</i>	325	<i>Hapalaræa pygmæa</i>	285
<i>Amblyopus palmipes</i> (sp. n.), Lewis	398	<i>Harpalus cupreus</i> , 134; <i>tenebrosus</i>	134
<i>Anaspis Garneysi</i> (sp. n.), Fowler, 333; <i>melanostoma</i> , 335; <i>subtestacea</i>	338	<i>Henoticus serratus</i>	401
<i>Anisotoma grandis</i> , 134; <i>parvula</i> , 134; <i>picea</i>	133	<i>Heptaulacus villosus</i>	325, 359, 383
<i>Aphodius eccoptus</i> (sp. n.), Bates, 297; <i>Zenkeri</i>	134	<i>Homalium septentrionis</i>	457
<i>Aspidiphorus orbiculatus</i>	326, 401	<i>Homalopia ruricola</i>	133, 359
<i>Athous difformis</i> , 133; <i>rhombeus</i>	401	<i>Homalota celata</i> , 401; <i>hepatica</i> , 360; <i>humeralis</i> , 401; <i>ignobilis</i>	401
<i>Baris cuprirostris</i> , 37; <i>transversa</i>	186	<i>Hoplia maculata</i> (sp. n.), Bates	298
<i>Batriscus venustus</i>	401	<i>Hydnobius strigosus</i>	326
<i>Bembidium Clarkii</i>	18	<i>Hydræna pygmæa</i>	325
<i>Byrrhus fasciatus</i> , 432; <i>kamtschaticus</i> ...	432	<i>Hydroporus incognitus</i>	18
<i>Cænopsis Waltoni</i>	134	<i>Hylotrupes bajulus</i>	186
<i>Carabus lateralis</i> , 390; <i>melancholicus</i> ...	390	<i>Ilyobates nigricornis</i>	134
<i>Cassida hemisphærica</i> , 134, 325; <i>murræa</i>	325	<i>Læmophlœus bimaculatus</i> , 133; <i>pusillus</i>	261
<i>Cathormiocerus maritimus</i> , 121; <i>socius</i> , 121, 134	121, 134	<i>Larinus carlinæ</i>	326
<i>Centhorrhynchus nigroterminatus</i> , 201; <i>punctiger</i>	200	<i>Lema bimaculata</i> (sp. n.), Baly	85
<i>Choleva spadicea</i>	18, 285	<i>Leptispa Godwini</i>	94
<i>Coccinella labilis</i>	36	<i>Liosomus oblongulus</i>	239
<i>Cœlabus quinquelineatus</i>	18	<i>Lymexylon navale</i>	401
<i>Conopalpus testaceus</i>	133, 360	<i>Mantura chrysanthemi</i>	18
<i>Cucujus coccinatus</i> , 84; <i>incommodus</i> , 84; <i>Mniszechii</i> , &c., 84; <i>opacus</i>	84	<i>Mecinus circulator</i>	17
<i>Dendrodipnis cænosus</i>	229	<i>Medon pocofer</i> , 17; <i>seminiger</i>	377
<i>Deronectes latus</i>	360	<i>Megacronus cingulatus</i>	18
<i>Diabrotica</i> (spp. nn.), Baly	251—254	<i>Megalopus Buckleyi</i> (sp. n.), Baly	203
<i>Diaæanthus bipustulatus</i>	133	<i>Melasis buprestoides</i>	360
<i>Dictyopterus minutus</i>	133, 134	<i>Meligethes exilis</i>	325
<i>Diglossa mersa</i>	17	<i>Meloë rugosus</i>	239
<i>Diplotaxis Heydeni</i>	186	<i>Micropeplus tesserula</i>	401
<i>Doryphora braziliensis</i> (sp. n.), Baly, 204; <i>brunneo-lineata</i> (sp. n.), Baly, 205; <i>piceofasciata</i> (sp. n.), Baly, 205; <i>undulato-</i> <i>fasciata</i> (sp. n.), Baly	206	<i>Miscodera arctica</i>	37
<i>Dromius vectensis</i>	17, 164	<i>Mordellistena humeralis</i>	134
<i>Dytiscus circumcinctus</i>	260	<i>Myrmedonia collaris</i>	259
<i>Entomoscelis metallica</i> (sp. n.), Baly	85	<i>Mysia Hornii</i>	164
		<i>Nebria Leechii</i> (sp. n.), Bates	297
		<i>Nosodendron asiaticum</i> (sp. n.), Lewis ...	229
		<i>Ocypus pedator</i>	133
		<i>Orobitis cyaneus</i>	139, 326
		<i>Parnus nitidulus</i>	435
		<i>Pausus Favieri</i>	378
		<i>Pelophilila borealis</i>	260
		<i>Peltastica Reitteri</i> , 432; <i>tuberculata</i>	432

	PAGE
<i>Pentarthrum Huttoni</i>	326
<i>Perileptus areolatus</i>	37
<i>Phaleria cadaverina</i> (larva)	304
<i>Phanæus lugens</i> (sp. n.), Nevinston ...	179, 214
<i>Pimelia Thomsoni</i> (sp. n.), „	255
<i>Plinthus caliginosus</i>	164
<i>Potaminus substriatus</i>	325, 360
<i>Pseudotrechus mutilatus</i>	377
<i>Ptenidium turgidum</i>	401
<i>Prionocyphon serricornis</i>	134
<i>Prionus coriarius</i>	401
<i>Quedius scitus</i> , 401; <i>xanthopus</i>	401
<i>Rhizophagus nitidulus</i>	401
<i>Rhopalomesites Tardii</i>	325
<i>Rhysodes americanus</i> , 432; <i>exaratus</i>	432
<i>Sagra papuana</i> (sp. n.), Baly	203
<i>Saperda scalaris</i>	401
<i>Saprinus semipunctatus</i> , 33; <i>virescens</i> ...	360
<i>Scydmaenus angulatus</i> , 133; <i>elongatulus</i> , 133; <i>Godarti</i> , 401; <i>præteritus</i> , 133; <i>Sparshalli</i>	401
<i>Sipalia testacea</i>	134, 214
<i>Sphindus dubius</i>	401
<i>Sternocælis acutangulus</i>	374
<i>Strangalia quadrifasciata</i>	325
<i>Stylops melittæ</i>	36, 293
<i>Tachycellus badiipennis</i>	186
<i>Teretriosoma Horni</i> (sp. n.), Lewis.....	397
<i>Thalycra sericea</i>	133, 134, 360
<i>Thymalus limbatus</i>	164
<i>Tiresias serra</i>	401
<i>Trechus lapidosus</i>	17
<i>Trichonyx Maerkeli</i>	17

DIPTERA.

<i>Acyphona imbuta</i>	98
<i>Allocotocera pulchella</i>	379
<i>Allœostylus sudeticus</i>	396
<i>Amalopsis claripennis</i> (sp. n.), Verrall, 97; occulta, 379; <i>pyrenaica</i> (sp. n.), Verrall.....	97
<i>Anthomyia Marshami</i>	211
<i>Anthrax fenestrata</i>	131
<i>Aricia</i>	393
<i>Atylotus fulvus</i>	281
<i>Callicera ænea</i>	186, 238
<i>Calliphora erythrocephala</i>	281
<i>Cecidomyia bigeloviae</i> (sp. n. ?), Cockerell, 324, 363; <i>pyrivora</i> , 323; <i>salicis-</i> <i>strobiloides</i>	324
<i>Chilosia mutabilis</i>	379
<i>Chilotrichia imbuta</i>	98

<i>Chortophila curvicauda</i>	449
<i>Chyliza leptogaster</i>	186
<i>Cladura fuscula</i> (= <i>Limnophila senilis</i>)... ..	98
<i>Conops strigatus</i>	379
<i>Criorhina ruficauda</i>	281
<i>Ctenophora flaveolata</i> , <i>ornata</i> , <i>pectini-</i> <i>cornis</i>	97
<i>Cynomyia mortuorum</i>	281
<i>Dasyphora cyanella</i> , <i>lasiophthalma</i>	281
<i>Dilophus febrilis</i>	280
<i>Diplosis fraxinella</i> (sp. n.), Meade, 77; <i>pyrivora</i>	323
<i>Dolichocheza sylvicola</i>	20
<i>Ephelia decora</i> (= <i>marmorata</i>)	98
<i>Eristalis cryptarum</i>	379
<i>Eutolmus rufibarbis</i>	281
<i>Gastrophilus equi</i>	281
<i>Graphomyia picta</i>	281
<i>Helophilus lunulatus</i>	281
<i>Hercostomus germanus</i>	214
<i>Hessian Fly</i>	134
<i>Hydrotæa parva</i> (sp. n.), Meade	448
<i>Hyetodesia</i> , 393; <i>basalis</i> , 394; <i>consobrina</i> , 395; <i>dubia</i> , Goberti, 424; <i>lugubris</i> , <i>morio</i> , <i>scutellaris</i> , 395; <i>sudetica</i> , 396; <i>vagans</i> , <i>variegata</i>	394
<i>Laphria flava</i>	281
<i>Lestophonon iceryæ</i>	257
<i>Limnophila senilis</i>	98
<i>Lucilia Cæsar</i>	67
<i>Musca domestica</i>	67
<i>Mydæa allotalla</i> , <i>grandæva</i> , 424; <i>im-</i> <i>puncta</i> , 211, 424; <i>nigricola</i> (= <i>nigri-</i> <i>color</i>), <i>separata</i> , Meig., 424; <i>separata</i> , <i>Schin.</i>	425
<i>Myopa polystigma</i>	281
<i>Nephrotoma dorsalis</i>	20
<i>Pachyrrhina analis</i> , <i>annulicornis</i> , <i>corni-</i> <i>cina</i> , 21; <i>crocata</i> , 20, 21; <i>guestfalica</i> , 21; <i>histrion</i> , <i>imperialis</i> , <i>maculosa</i> , <i>quadrifaria</i> , <i>scurra</i>	20, 21
<i>Pegomyia flavipes</i> , <i>transgressa</i>	449
<i>Phora rufipes</i>	282
<i>Sarcophaga fulvicauda</i> (sp. n.), Meade ...	28
<i>Sericomyia lappona</i>	379
<i>Spilogaster anceps</i> , 426; <i>atripes</i> (sp. n.), Meade, 425; <i>bisignata</i> , <i>demigrans</i> , 424; <i>fratercula</i> , 425; <i>impuncta</i> , 211, 424; <i>pertusa</i> , 425; <i>spinifemorata</i> (sp. n.), Meade	426
<i>Stratiomyia longicor</i> is.....	280
<i>Syrphus arcuatus</i> , 281; <i>excisus</i> , <i>nitens</i> , 379; <i>pyrastri</i>	281

	PAGE
<i>Tabanus tropicus</i>	281
<i>Tachina setipennis</i>	282
<i>Theria muscaria</i>	27, 379
<i>Tipula confusa</i> , 23, 24; <i>excisa</i> , 22, 25; <i>fascipennis</i> , 24, 26; <i>flavolineata</i> , 24, 25; <i>gigantea</i> , <i>hortensis</i> , 22; <i>hortu-</i> <i>lana</i> , 23, 25; <i>lateralis</i> , 23, 26; <i>longi-</i> <i>cornis</i> , 23, 25; <i>lunata</i> , <i>luteipennis</i> , 24, 25; <i>lutescens</i> , 22; <i>marginata</i> , 23, 26; <i>marmorata</i> , 23, 24; <i>melano-</i> <i>ceras</i> , 23, 25; <i>nigra</i> , 23, 24; <i>nubecu-</i> <i>losa</i> , 22, 25; <i>obsoleta</i> , 23; <i>ochracea</i> , 24, 26; <i>oleracea</i> , 23, 26; <i>pabulina</i> , 22; <i>pagana</i> , 24; <i>paludosa</i> , 23, 26; <i>pelio stigma</i> , 24, 26; <i>plumbea</i> , <i>pruin-</i> <i>osa</i> , 24, 25; <i>rufina</i> , 23, 24; <i>scripta</i> , 22, 25; <i>Selene</i> , 24, 26; <i>signata</i> , 23, 24; <i>truncorum</i> , 22; <i>vaga</i> , 24, 27; <i>vari-</i> <i>pennis</i> , 23, 25; <i>vernalis</i> , <i>vittata</i> , 22, 26; <i>sp. ?</i>	25
<i>Trichophthicus</i> , 393; <i>hirsutulus</i> , <i>inno-</i> <i>cuus</i>	449
<i>Trypeta</i> , <i>sp. ?</i>	363
<i>Xiphura nigricornis</i>	280

HEMIPTERA.

<i>Acocephalus nervosus</i>	435
<i>Aleurodes ribium</i> , 256; <i>vaccinii</i>	256
<i>Amblytylus affinis</i> , 401; <i>delicatus</i> ..	78
<i>Anthocoris visci</i> (<i>sp. n.</i>), Doug.	427
<i>Aspidiotus acaciæ</i> (<i>sp. n.</i>), Morgan, 353; <i>articulatus</i> (<i>sp. n.</i>), Morgan, 352; <i>buxi</i> , 120; <i>camelliæ</i> , 119, 351; <i>dic-</i> <i>tyospermi</i> , <i>longispina</i> (<i>sp. n.</i>), Morg., 352; <i>nerii</i> , 46, 120, 194, 350; <i>ostreæ-</i> <i>formis</i> , 46, 119, 350; <i>pandani</i> , 119; <i>perseæ</i> , 350; <i>personatus</i> , 351; <i>rapax</i> , 119; <i>zonatus</i>	46, 120, 351
<i>Chionaspis fraxini</i> , ♂, <i>macrop.</i> and <i>apt.</i> ..	436
<i>Cixius brachycranus</i> , 101; <i>contaminatus</i> , 100; <i>cunicularius</i> , 101; <i>intermedius</i> , 100; <i>nervosus</i> , 100, 101; <i>pilosus</i> , 101; <i>remotus</i> , Scotti, <i>similis</i> , 100, 101; <i>simplex</i> , 100; <i>stigmaticus</i>	101
<i>Coccina</i>	189, 405
<i>Coccus agavium</i> (<i>sp. n.</i>), Doug., 150; <i>cacti</i>	382
<i>Corizus maculatus</i>	401
<i>Dactylopius adonidum</i> , 314; <i>citri</i> , 194, 275; <i>theobromæ</i> (<i>sp. n.</i>), Doug.	317
<i>Diaspina</i>	44, 189, 405
<i>Diaspis ostreæformis</i> , 119; <i>visci</i>	277
<i>Dicyphus constrictus</i>	36
<i>Eccritotarsus exitiosus</i> (<i>sp. n.</i>), Dist.	202
<i>Eroticoris rufescens</i>	238, 401

	PAGE
<i>Fiorinia pellucida</i>	46
<i>Helopeltis febriculosa</i> (<i>sp. n.</i>), Bergr.	271
<i>Hemi-Coccidinae</i>	275, 405
<i>Homœoceros lacertosus</i> (<i>sp. n.</i>), Dist., 230; <i>sikkimensis</i> (<i>sp. n.</i>), Dist.	231
<i>Icerya Purchasi</i>	232, 257
<i>Ischnaspis filiformis</i>	151
<i>Ischnocoris angustulus</i> , 149; <i>hemipterus</i> , 35, 149	
<i>Kermes Bauhinii</i>	408
<i>Lecanina</i>	189, 405
<i>Lecanium acuminatum</i> , 250; <i>bitubercu-</i> <i>latum</i> , 59; <i>clypeatum</i> (<i>sp. n.</i>), Doug., 58; <i>lauri</i> , 57; <i>mangiferæ</i> (<i>sp. n.</i>), Green, 248; <i>oleæ</i> , 194, 275; <i>viride</i> (<i>sp. n.</i>), Green	249
<i>Lopus sulcatus</i>	326
<i>Lybas nodulosus</i> (<i>sp. n.</i>), Dist.	231
<i>Lygus viscidola</i>	256, 396, 457
<i>Macrodema microptera</i> , <i>macropt.</i>	401
<i>Monanthia angustata</i> , 34; <i>4-maculata</i> ...	401
<i>Mytilaspis pomorum</i>	16, 46, 119
<i>Nabis limbatus</i>	457
<i>Orthezia insignis</i>	270
<i>Ortonia natalensis</i> (<i>sp. n.</i>), Doug.	86, 232
<i>Pendulinus orientalis</i> (<i>sp. n.</i>), Dist.	231
<i>Platymetopius undatus</i>	402
<i>Prionolomia aberrans</i> , <i>pallescens</i> (<i>sp. n.</i>), Dist.	230
<i>Pseudococcus aceris</i> , 125; <i>ulicis</i> (<i>sp. n.</i>), Doug., 88; <i>ulmi</i> (<i>sp. n.</i>), Doug.	124
<i>Salda lateralis</i> , 237; <i>saltatoria</i>	237
<i>Scolopostethus adjunctus</i> , 149, 279, 380; <i>affinis</i> , 149, 279, 296, 381; <i>decoratus</i> , 149, 279; <i>ericetorum</i> , 149; <i>neglectus</i> , (<i>sp. n.</i>), Edw., 279, 296; <i>pictus</i> , 278; <i>pilosus</i> , 149; <i>punctatus</i> (<i>sp. n.</i>), Edw., 279, 296, 380	
<i>Sthenarus visci</i>	256, 457
<i>Thamnotettix cruentata</i>	402
<i>Typhlocyba avellanæ</i> , <i>hippocastani</i> (<i>sp.</i> <i>n.</i>), Edw., 157; <i>opaca pruni</i> (<i>sp. n.</i>), Edw.	158
<i>Vinsonia stellifera</i>	152

HYMENOPTERA.

<i>Amblyopone denticulata</i>	17
<i>Amblyteles bicolor</i> , <i>erythropygus</i> , <i>fascia-</i> <i>torius</i> , <i>fumipennis</i> , <i>palliatorius</i> , 36; <i>proteus</i> , 455; <i>quadrifasciatus</i>	36
<i>Andrena</i> and <i>Stylops</i>	293
<i>Andrena Afzeliella</i> , 128; <i>cineraria</i> , 165; <i>convexiuscula</i> , 128; <i>fasciata</i> , 165; <i>fuscata</i> , <i>intermedia</i> , <i>similis</i> , <i>Wilkella</i> , <i>xanthura</i>	128

	PAGE
Anochetus Ghilianii	17, 61
Apanteles ferrugineus, 67; hoplites	282
Aphænogaster sardoa	17
Aporus unicolor	131
Bombus pomorum, Scrimshiranus	435
Camponotus cruentatus	17
Charops decipiens	185
Crabro leucostoma	400
Elampus Panzeri	131
Halictus atricornis	434
Hoplisus bicinctus	435
Leptothorax Rottenbergi	17
Lophyrus pini	131
Microdus calculator	353
Mimesa Dahlbomi	131
Monomorium subopacum	17
Nomada borealis, 165; Roberjeotiana ..	131
Oxybelus mandibularis	131
Pelecystoma lutea	433
Pezomachus corruptor, dysalotus, faunus, insidiosus	185
Pompilus Wesmæli	131
Priocnemis affinis	435
Sapyga quinqueguttata	165
Sirex gigas	132
Sphecodes ferruginatus, 434; spinulosus..	206
Sphinctus serotinus	433
Spudastica petiolaris	163
Trogus exaltatorius	455

LEPIDOPTERA.

Abraxas adustata, conspurcata, grossu- lariata, leopardina, marginata, mar- taria, miranda, sylvata, ulmata	179
Acherontia Atropos	285
Acidalia bisetata, 259; immorata	213
Acontia luctuosa, 208; solaris	246
Acrolepia assectella	291
Agdistis Bennettii	399
Agrotis corticea, 305; cursoria, 399; ex- clamationis, 221; nigricans v. Mar- shallana, 305; ripæ, 399; saucia, 324; subgothica	224, 246
Alucita hexadactyla	213
Amblypodia Sophrosyne (sp. n.), Grose Smith	300
Angerona prunaria	179
Anomogyna letabilis	444
Anthocharis Belia, 208, 209; cardamines, 81, 439; Euphenoides	208
Aplasta ononaria	213
Aplecta nebulosa, occulta	305

	PAGE
Aplota palpella	174
Arctia villica	209
Argynnis Aglaia, 81; Euphrosyne, 440; Lathonia, 209, 441; Niobe, v. Eris, 441; Pales, 441; Selene	81
Argyrolepis sub-baumanniana	306
Argyronympha rubianensis (sp. n.), Grose Smith, 299; ulava (sp. n.), Grose Smith	299
Asopia glaucinalis	179
Aspilates formosaria, 179; gilvaria, 208; mundataria, niponaria, 179; strigil- laria, 259; tonghata	179
Asychna æratella	306
Bactra furfurana	238
Bapta bimaculata	179
Batrachedra præangusta	185
Belemnia Whiteleyi (sp. n.), Druce	62
Boarmia rhomboidaria	456
Bohemannia quadrimaculella	145
Botys fulvalis	50, 51
Bryophila algæ	283
Butalis fusco-cuprea, 306; siccella	174
Cabera exanthemata	179
Callimorpha Hera, 50; jacobææ	444
Caradrina alsines	305
Carpocapsa grossana, 306; juliana	220
Cateremna terebrella	399
Catocala fraxini, 247, 399; sponsa	399
Cenoloba oblitalis	372
Cerostoma alpella, Chazariella, lucella, Manniella, parenthesesella, persicella, radiatella, sequella, sylvella, vittella...	155
Charaxes Attila (sp. n.), Grose Smith	301
Chariclea delphiini	247
Chauliodes insecurellus	174, 361, 400
Chionobas Aello, Jutta, 322; Norna, 322, 362, 442	442
Chærocampa Elpenor	259
Choreutes vibrana	456
Chrysophanus Phlæas	83
Cidaria albicillata, corylata, procellata, rivata, sordidata, tersata	178
Cirrædia xerampelina	76
Cladodes gerronella	361
Coccyx argyrana, splendulana	217
Cænobia despecta, rufa	55
Cænonympa Davus, 259; Pamphilus...82, 443	443
Coleophora albicosta, niveicostella, 174; vulnerariæ, Larva of	381
Colias Edusa, 49, 81, 208, 209; Eriphyle, 324; Hyale	209
Collita ægrota	178

	PAGE
<i>Cosmia affinis</i> , Larva of	298
<i>Cosmopteryx orichalcea</i> , 112; <i>Schmidiella</i> 307	
<i>Crambus cerussellus</i> , 322; <i>duplicatus</i> , <i>hemiochrellus</i> , 92; <i>inquinatellus</i> , 171; <i>luteolellus</i> , 92; <i>margaritellus</i> , 444; <i>myellus</i> , 431; <i>truncatellus</i> , 322, 363; <i>ulæ</i> , 92; <i>zeelus</i>	92
<i>Cyclopides puelmæ</i> (sp. n.), Bartlett- Calvert	34
<i>Cymatophora duplaris</i> , <i>ocularis</i>	305
<i>Deilephila celerio</i> , 283; <i>euphorbiæ</i> , 49; <i>galii</i> , 186, 284, 455; <i>insidiosa</i> , 361; <i>livornica</i>	283
<i>Deiopeia pulchella</i>	283
<i>Dianthœcia conspersa</i>	259
<i>Diasemia Ramburialis</i>	381
<i>Diurnea fagella</i>	40, 102
<i>Doryphora servella</i>	361
<i>Eecopsis latifasciana</i>	172
<i>Eilicrinia cordiaria</i>	179
<i>Elodina umbratica</i> (sp. n.), Grose Smith... 302	
<i>Ephippiphora gallicolana</i> , <i>obscurana</i> . 217, 219	
<i>Epischnia Banksiella</i> , 63; <i>Boisduvaliella</i> , 172; <i>Farrella</i> , 225; <i>terebrella</i>	399
<i>Erebia Blandina</i> , 321; <i>Euryale</i> , 441; <i>lappona</i> , 441; <i>Ligea</i>	321, 362, 441
<i>Eubolia lineolata</i>	138
<i>Eudemis euphorbiana</i>	185
<i>Eupithecia arceuthata</i> , 185; <i>extensaria</i> , 258, 398; <i>fraxinata</i> , 76; <i>irriguata</i> , 184; <i>sobrinata</i>	259
<i>Euplexia lucipara</i>	259
<i>Eupœcilia dubitana</i>	430
<i>Eurhodope argyreus</i>	247
<i>Eurymene dolabraria</i>	306
<i>Fumea</i> (?) <i>limulus</i>	362
<i>Gelechia artemisiella</i> , 306; <i>atrella</i> , 318, 382; <i>gerronella</i> , 361; <i>lathyri</i> , 306; <i>servella</i> , 361; <i>vicinella</i>	306
<i>Gnophos sordaria</i>	444
<i>Gonepteryx Cleopatra</i> , 208, 209; <i>rhanni</i> 81, 92, 135, 158, 439	
<i>Gracilaria syringella</i>	103
<i>Grapholitha consequana</i> , <i>littorana</i>	173
<i>Hadena albifusa</i> , 180, 228; <i>oleracea</i> , <i>pisi</i> , 259; <i>suasa</i>	305
<i>Heliodes arbuti</i>	209
<i>Heliothis armigera</i> , 324; <i>scutosa</i>	225
<i>Hepialus humuli</i> , 444; <i>velleda</i>	259
<i>Hesperia Actæon</i> , 280; <i>comma</i>	444
<i>Heusimene fimbriana</i>	217, 218
<i>Histea dolens</i> (sp. n.), Druce	62
<i>Homœosoma ninbella</i>	245

	xxi. PAGE
<i>Hybernia leucophearia</i> , 179; <i>progemmaria</i> , 102	
<i>Hydrilla palustris</i>	225
<i>Hydrœcia nictitans</i>	213
<i>Hylophila prasinana</i>	257
<i>Hyponomeuta cognatella</i>	306
<i>Ismene Anchises</i> , Larva of, 428; <i>Forestan</i> , Larva of	428
<i>Lælia cœna</i>	283
<i>Lamprotes atrella</i>	318, 382
<i>Larentia didymata</i> , 259; <i>salicata</i>	259
<i>Larinopoda albula</i> (sp. n.), Druce	108
<i>Lasiommata Ægeria</i> , <i>Megæra</i>	82
<i>Laverna definitella</i>	214
<i>Leioptilus osteodactylus</i>	444
<i>Leucania extranea</i> , 56; <i>pudorina</i> , 305; <i>unipuncta</i>	56
<i>Leucophasia Duponcheli</i>	209, 212
<i>Limacodes testudo</i>	433
<i>Limenitis Camilla</i> , 209; <i>Sibylla</i>	360
<i>Liptena rubrica</i> (sp. n.), Druce	108
<i>Lithosia adaucta</i> , 178; <i>caniola</i> , 49; <i>de</i> - <i>plana</i> , <i>griseola</i>	178
<i>Lomaspilis opis</i>	179
<i>Lycœna Ægon</i> , 440; <i>Alexis</i> , 83; <i>Argiolus</i> , 209; <i>Artaxerxes</i> , 429; <i>Astrarche</i> , <i>Baton</i> , <i>Bellargus</i> , <i>Corydon</i> , <i>Cyllarus</i> , 209; <i>dispar</i> , 283, 284; <i>exilis</i> , 429; <i>Icarus</i> , 209, 322, 440; <i>melanops</i> , 209; <i>Pheretes</i> , 440; <i>semiargus</i>	209
<i>Macroglossa stellatarum</i>	259
<i>Mamestra abjecta</i> , 305; <i>chenopodii</i>	228
<i>Melanippe casta</i> , 178; <i>efferata</i> , 179; <i>inqui</i> - <i>nata</i> , 178; <i>restituta</i> , 179; <i>supergressa</i> 178	
<i>Melanthia albicillata</i>	259
<i>Melitæa Artemis</i> , 81; <i>Athalia</i> , 440; <i>minuta</i> , 93; <i>Phœbe</i>	209
<i>Micra ostrina</i>	209
<i>Micropteryx aruncella</i> , <i>Seppella</i>	185
<i>Milionia Pryeri</i> (sp. n.), Druce	62
<i>Mimæseoptilus bipunctidactylus</i> , <i>plagio</i> - <i>dactylus</i>	306
<i>Minoa euphorbiata</i>	209
<i>Miselia oxyacanthæ</i>	102
<i>Mycalesis interrupta</i> (sp. n.), Grose Smith 299	
<i>Nemeophila plantaginis</i>	259
<i>Nepticula fulgens</i> (sp. n.), Stainton	
<i>Nisoniades Tages</i>	209
<i>Noctua subrosea</i>	284
<i>Nonagria arundineta</i> , 56; <i>concolor</i> , <i>ex</i> - <i>trema</i> , <i>fulva</i> , 52; <i>neurica</i> , 56; <i>typhæ</i> 259	
<i>Notodonta bicolora</i> , 283; <i>ziczac</i>	259
<i>Nudaria mundana</i>	444

xvii.	PAGE
Nyssia zonaria	283
Æcophora stipella	457
Æonistis dives, quadra	178
Oinophila vau-flava	238
Oporabia filigrammaria, 213; sexifasciata	178
Opostega auritella, crepusculella, salaciella, spatulella	145
Orrhodia rubiginea.....	284
Ortholitha peribolata	50, 51
Orthosia suspecta	305
Oxyptilus didactylus, distans, ericetorum, heterodactylus, hieracii, lætus, parvidactylus, pilosellæ, teucarii.....	431
Pandemis cinnamomeana	185
Papilio Ariel (sp. n.), Grose Smith, 303; Machaon, 79, 209; Podalirius, 209; Prospero (sp. n.), Grose Smith.....	302
Pararge Hiera, 322, 443; Mæra	322, 443
Penthina rivulana	185
Periclymenobius falcellus, nemorellus, xylostellus	155
Phasiane petrararia	179
Phibalapteryx lapidata	162, 213
Phlæodes Demarniana	259
Phytometra Hawthorthana, 247; minuta... ..	247
Pieris agnata (sp. n.), Grose Smith, 301; Daplidice, 49; napi, 80; rapæ	80
Pionea forficalis, sodalis.....	179
Platyptilia Fischeri, 322; Zetterstedtii ..	444
Plusia aurifera, 223, 246; brassicæ, 324; festuæ, 259; illustris, 223, 246; ni, 184, 324; pulchrina	259
Polyommatus Acis, bætica, 283; Gordius 209; Phlæas	439
Psecadia decemguttella, 185; semilugens..	214
Pseuderesia Helena (sp. n.), Druce	108
Pseudophia illunaris	228
Pterophorus isodactylus	455
Pterostoma palpina	444
Pyralis yokohamæ	179
Retinia duplana, 146; posticana, 181, 196, bred	307
Rhodaria sanguinalis.....	208
Rhyparia fraterna, melanaria, sordida ...	179
Sarrothrips ilicanus	247
Saturnia pavonia-minor	444
Satyrus Hyperanthus, 82; Semele, 322, 362; Tithonus	82
Scoparia alpina, gracilalis.....	185
Sericoris abscisana, Dbl., fuligana, Haw., Stn., Larva of	430
Sesia fuciformis, 209; scolizæformis	444
Sideria achatana	172
Smerinthus populi	259

	PAGE
Sphinx convolvuli, 456; ligustri, 111; pinastri	159
Spilothyrus alceæ, altheæ, lavateræ.....	209
Stauropus fagi	107
Syrichthus alveolus, 83; alveus, 209; malvæ, Sao	83, 209
Teriomima melissa (sp. n.), Druce	109
Thais Polyxena, rumina	209
Thecla Alcestis (sp. n.), Grose Smith, 300, 382; rubi	209, 306, 439
Thestor Ballus	208
Thyanochilus purus	179
Timandra amata, convectaria	178
Tinea decorella, 7; flavescentella, merdella, 173; pallescentella, 213; semifulvella ..	306
Tingra tripunctata (sp. n.), Druce	109
Tortrix decretana, 243; dumetana, 172; fraternana, 6; Lafauriana	245
Toxocampa pastinum.....	306
Trachoma asperella, horridella, instabilella, scabrella	155
Trifurcula immundella, 446; pallidella ...	445
Triphæna fimbria, 259; orbona, pronuba, 221	
Vanessa Antiopa, 209, 225, 429; Egea, 209; Io, 226, 269; polychloros, 269; urticæ, 227, 269; v. polaris	321, 362
Venilia maculata	209
Xanthia cerago, 247; fulvago, 259; silago ..	241
Xylina socia	284
Zeuzera æsculi	456
Zygæna filipendulæ, 184, 212, 289, 290; trifolii	212

NEUROPTERA.

Æschna borealis	273, 283
Agapetus delicatulus	235
Agrypnia islandica, 421; Pagetana... ..	215, 323
Apatania arctica, 423; muliebris	241
Baëtis atrebatinus, binoculatus, 29; buceratus, niger, pumilus, 30; rhodani, scambus, 29; tenax, 30; vernus.....	29
Cænis dimidiata, halterata, Harrisella, rivulorum	12
Centroptilum luteolum, 30; pennulatum. ..	31
Chimarra marginata	262
Chrysopa nigropunctata, 346; tenella, 132, 215	
Cloëon dipterum, rufulum, simile	31
Corydalis asiatica	133
Creagris v-nigrum	345
Diplacina flavistyla	348
Ecdyurus insignis, 32; lateralis, 33; venosus, 32; volitans	33
Ephemera danica, 10; lineata, 11; vulgata	10

	PAGE
Ephemerella ignita, 11; notata	12
Formicaleo annulatus	347
Grammotaulius atomarius	421
Habrophlebia fusca	11
Hemianax ephippiger	348
Heptagenia flavipennis, sulphurea	32
Holocentropus stagnalis	235
Ischnura Graellsii, 348; maroccana	349
Leptophlebia cincta, marginata, submar- ginata	11
Libellula fulva, 163; quadrimaculata...	93, 324
Limnophilus affinis, griseus, picturatus...	422
Lype fragilis	235
Molanna palpada	93
Myrmeleon distinguendus, 347; irrorat- us, 346; nemausiensis	345
Neuronix clathrata	67
Orthetrum nitidineris, 346; Ramburii...	348
Orthotrichia angustella	93
Palpares hispanus	345, 346
Panorpa meridionalis	344
Philopotamus montanus	89
Potamanthus luteus	11
Psocus obscurus	210
Rhithrogena semicolorata	32
Setodes punctata	383
Siphylurus armatus, lacustris	31
Stenophylax latipennis, stellatus, 235; vibex	323

	xxiii. PAGE
Sympetrum Fonscolombii	163, 346
Tinodes maculicornis	283

ORTHOPTERA.

Anisolabis maritima	356
Blabera gigantea	372
Chelidura albipennis	359
Decticus griseus	215
Ectobia lapponica, 367; livida, pallens, 369; Panzeri	368, 398
Forficula auricularia, 282, 357; pubescens, 358, 429	
Gomphocerus maculatus, 215, 420: ru- fus, 419; sibiricus	421
Labia minor	357
Labidura riparia	356
Mecostethus grossus	412
Œdipoda cærulescens	453
Pachytylus cinerascens, 451; migratorius	450
Panchlora maderæ	372
Periplaneta australasiæ, orientalis	371
Pezotettix pedestris	452
Psophus stridulus	452
Phyllodromia germanica	370
Schistocerca peregrina	453
Stenobothrus bicolor, 215, 417; elegans, 215, 418; lineatus, 414; parallelus, 418; rufipes, 416, 429; viridis	415
Tettix bipunctatus, subulatus	454
Xiphidium dorsale	215

INDEX TO CONTRIBUTORS.

	PAGE
Aaron, E. M.	429
Adkin, Robert, F.E.S.	160
Albarda, Herman	210
Atmore, E. A., F.E.S.	243
Baker, G. T., F.L.S.	136, 212
Balding, A.	238
Baly, J. S., F.L.S.	85, 251
Bankes, E. R., M.A., F.E.S. ...	1, 16, 306, 307 445, 455, 456
Barker, H. W., F.E.S.	18, 40, 71, 95, 116, 166, 187, 215, 239, 263, 286, 311, 329, 386, 403, 436, 458
Barnard, George	182
Barrett, C. G., F.E.S.	79, 109, 137, 138, 139, 159, 160, 180, 181, 220, 223, 258, 259, 305, 306, 399, 430, 456
Bartlett-Calvert, W., F.E.S.	34
Bates, H. W., F.R.S., &c.	297
Bennett, W. H.	164, 326, 360

	PAGE
Bergroth, Dr. E.	271
Bignell, G. C., F.E.S.	326
Bird, G. W.	92, 381
Blandford, W. F. H., B.A., F.E.S. ...	325, 435
Blatch, W. G.	401, 457, 458
Bloomfield, Rev. E. N., M.A., F.E.S., 238, 399, 429, 455	
Boyd, W. C., F.E.S.	301
Bridgman, J. B., F.L.S.	36, 67, 163, 185, 282, 283, 433
Briggs, C. A., F.E.S.	185
Bristow, Rev. J., M.A.	283
Brown, J., F.E.S.	134
Brunetti, E.	68, 280
Buckton, G. B., F.R.S., &c.	94
Burney, Rev. H., M.A.	91
Butler, A. G., F.L.S., &c.	268
Butler, E. A., B.A., F.E.S.	282, 401

	PAGE		PAGE
Champion, G. C., F.E.S.	37, 70, 121, 133, 134	Marriott, Allan	360
Chapman, T. A., M.D.	38, 40, 73, 135, 213	Maskell, W. H., F.R.M.S.	405
Clarke, A. H.	162	Mason, P. B., F.L.S.	162
Cockerell, T. D. A.	67, 92, 93, 164, 186, 213, 255, 308, 363, 382	Mathew, G. F., R.N., F.L.S., &c.	428
Cordeaux, John	93, 111	Matthews, Coryndon, F.E.S.	378
Dale, C. W., F.E.S.	246, 429	Meade, R. H.	27, 77, 186, 211, 393, 424, 448
Digby, Rev. C. R., M.A.	283, 381	Meek, E. G.	111
Distant, W. L., F.E.S.	202, 230	Merrifield, F., F.E.S.	38, 308
Douglas, J. W., F.E.S.	16, 57, 86, 124, 150, 232, 256, 257, 270, 277, 314, 396, 427, 435, 457	Meyrick, E., B.A., F.E.S.	175, 178, 184, 361, 372
Douglas, W. D. R., F.L.S.	37	Morgan, Albert C. F., F.L.S.	42, 118, 189, 275, 349
Druce, Hamilton H., F.E.S.	108	Morice, Rev. F. D., M.A., F.E.S.	434
Druce, Herbert, F.L.S.	62	Morris, C. H.	36
Eardley-Mason, J.	36, 236, 237, 457	Morton, Kenneth J.	89, 93, 235, 262, 323, 383
Eaton, Rev. A. E., M.A., F.E.S.	9, 29, 214	Nevinson, B. G., M.A., F.Z.S.	179, 184, 214, 255
Edwards, James, F.E.S.	100, 157, 278, 380	Newstead, Robert	436
Elliot, A.	429	Pender, J.	93
Ellison, S. T.	431, 457	Perkins, R. C. L.	128, 206
Fenwick, N. P., F.E.S.	268	Porritt, G. T., F.L.S.	13, 39, 112, 132, 161, 214, 245, 298, 398
Fletcher, J. E., F.E.S.	313, 383, 400	Richardson, Nelson M.	63, 289
Fletcher, W. H. B., M.A., F.E.S.	15, 65	Saunders, Edward, F.L.S.	17, 34, 35, 36, 61, 65, 78, 131, 148, 293, 295, 380, 429, 446
Fowler, Rev. Canon, M.A., F.L.S.	17, 41, 200, 287, 304, 311, 331, 363, 400, 435	Schöyen, W. M.	320
Frohawk, F. W.	113, 268	Selys-Longchamps, Baron E. de, Hon. F.E.S.	135
Gardner, J.	131	Sharp, David, M.B., F.L.S.	121
Godwin, W. A.	159	Shaw, Eland, F.E.S.	354, 365, 409, 450
Goss, Herbert, F.L.S.	19, 72, 96, 143, 168, 187, 216, 240, 264, 287, 311, 329, 386, 404, 429, 437, 459	Smith, H. Grose, F.E.S.	299
Green, E. Ernest	248	Smith, J. B.	228
Greene, Rev. J., M.A., F.E.S.	161	Stainton, H. T., F.R.S., &c.	12, 39, 91, 169, 225, 268, 291, 318, 361
Hall, A. E.	103, 162, 247	Stevens, Samuel, F.L.S.	91, 291
Hall, C. G.	163, 164, 257, 261, 324	Still, Major John H.	284
Hering, Major E.	39, 212, 238	Thompson, W. B.	91
Holland, W.	107	Thouless, H. J.	159
Jacoby, Martin, F.E.S.	203	Tugwell, W. H.	112, 135, 284
Jenner, J. H. A., F.E.S.	68, 383	Tutt, J. W., F.E.S.	52, 104, 105, 400
Johnson, Rev. W. F., M.A., F.E.S.	18, 132, 139, 239, 259, 285	Verrall, G. H., F.E.S.	20, 97, 186
Jones, Albert H., F.E.S.	208, 211, 212	Wainwright, Colbran J.	285, 309, 328, 386, 403, 436, 456, 458
Jordan, R. C. R., M.D.	49, 102, 136, 213, 362, 439	Walker, J. J., R.N., F.E.S.	33, 63, 325, 359, 360, 374, 389
Kenrick, G. H.	92, 158	Walsingham, Rt. Hon. Lord, M.A., F.R.S., &c.,	153
Keys, J. H.	214, 326	Warren, William, M.A., F.E.S.	5, 145, 146, 161, 171, 196, 307
King, J. J. F. X.	93, 235, 283, 383	Waterhouse, C. O., F.E.S.	271
Kirby, W. F., F.E.S.	361	Waterhouse, E. A.	133
Klapálek, Prof. Fr.	241, 339, 434	Webb, Sydney	382
Lewis, George, F.L.S.	84, 94, 229, 397, 432	Wilding, R.	37
McLachlan, Robert, F.R.S., &c.	67, 133, 273, 344, 362, 421	Wood, John H., M.B.	66, 126, 217
Malings, J.	133	Wood, Rev. Theodore, F.E.S.	239
Manders, N., F.E.S.	37		

LIST OF NEW GENERA AND SPECIES, &c., DESCRIBED IN THIS VOLUME.

COLEOPTERA.

SPECIES.	PAGE
<i>Amblyopus palmipes</i> , <i>Lewis</i> , <i>Japan</i>	397
<i>Anaspis Garneysi</i> , <i>Fowler</i> , <i>London District</i> ..	333
<i>Aphodius eccoptus</i> , <i>Bates</i> , <i>Nikko</i>	297
<i>Diabrotica atrilineata</i> , <i>Baly</i> , <i>Brazil</i>	252
<i>Borrei</i> , " "	253
<i>Buqueti</i> , " <i>Cayenne</i> ..	252
<i>caviceps</i> , " <i>Amazons</i> ..	253
<i>corrugata</i> , " <i>Cauca</i>	254
<i>cruciata</i> , " <i>Brazi'</i>	253
<i>Donckieri</i> , " "	252
<i>excelsa</i> , " <i>Cauca</i>	254
<i>Gestroi</i> , " <i>Peru</i>	253
<i>guttifera</i> , " <i>Cayenne</i> ..	251
<i>Illigeri</i> , " <i>Amazons</i> ..	251
<i>Javeti</i> , " <i>Brazil</i>	251
<i>nigritarsis</i> , " <i>Amazons</i> ..	252
<i>pectinicornis</i> , " <i>Cauca</i>	252
<i>reticulata</i> , " "	254
<i>sordidipennis</i> , " "	253
<i>Staudingeri</i> , " "	254
<i>tarsalis</i> , " <i>Bahia</i>	254
<i>torta</i> , " <i>Cauca</i>	254
<i>Volxemi</i> , " <i>Brazil</i>	253
<i>Westwoodi</i> , " <i>Amazons</i> ..	252
<i>Doryphora braziliensis</i> , " <i>Ecuador</i> ..	204
<i>brunneo-lineata</i> , " <i>Brazil</i> ..	205
<i>piceofasciata</i> , " <i>hab. ?</i>	205
<i>undulato-fasciata</i> , " <i>Colombia</i> ..	206
<i>Entomoscelis metallica</i> , " <i>Sikkim</i> ..	85
<i>Gonophora Masoni</i> , " <i>Andaman Islands</i> ..	86
<i>Hoplia maculata</i> , <i>Bates</i> , <i>Satsuma</i>	298
<i>Lema bimaculata</i> , <i>Baly</i> , <i>Andaman Islands</i> ..	85
<i>Megalopus Buckleyi</i> , " <i>Ecuador</i>	203
<i>Nebria Leechii</i> , <i>Bates</i> , <i>Nikko</i>	297
<i>Nosodendron asiaticum</i> , <i>Lewis</i> , <i>Japan</i> ..	229
<i>Phanæus lugens</i> , <i>Nevinson</i> , <i>Venezuela</i> ..	179
<i>Pimelia Thomsoni</i> , " <i>Atlas Mts.</i> ..	255
<i>Sagra papuana</i> , <i>Baly</i> , <i>New Guinea</i>	203
<i>Teretriosoma Horni</i> , <i>Lewis</i> , <i>Florida</i>	397

DIPTERA.

SPECIES.	PAGE
<i>Amalopsis claripennis</i> , <i>Verrall</i> , <i>Britain</i> ..	97
<i>pyrenaica</i> , " <i>Pyrenees</i> ..	97
<i>Cecidomyia bigeloviae</i> , <i>Cockerell</i> (undescribed), <i>Colorado</i> ..	324, 363
<i>Diplosis fraxinella</i> , <i>Meade</i> , <i>Britain</i>	77
<i>Hydrotæa parva</i> , " <i>England</i>	448
<i>Sarcophaga fulvicauda</i> , " <i>Britain</i>	28
<i>Spilogaster atripes</i> , " "	425
<i>spinifemorata</i> , " "	426

HEMIPTERA.

SPECIES.	PAGE
<i>Anthocoris visci</i> , <i>Doug.</i> , <i>England</i>	427
<i>Aspidiotus acaciæ</i> , <i>Morg.</i> , <i>Tasmania</i>	353
<i>articulatus</i> , " <i>Demerara</i>	352
<i>dictyospermi</i> , " "	352
<i>longispina</i> , " "	352
<i>Coccus agavium</i> , <i>Doug.</i> , <i>N. America</i>	150
<i>Dactylopius theobromæ</i> , <i>Doug.</i> , <i>S. America</i> ..	131
<i>Eccritotarsus exitiosus</i> , <i>Dist.</i> , <i>Trinidad</i> ..	202
<i>Helopeltis febriculosa</i> , <i>Bergr.</i> , <i>Sikkim</i> ..	271
<i>Homæocerus lacertosus</i> , <i>Dist.</i> , <i>E. India</i> ..	230
<i>sikkimensis</i> , " <i>Sikkim</i> ..	231
<i>Lecanium clypeatum</i> , <i>Doug.</i>	58
<i>mangiferæ</i> , <i>Green</i> , <i>Ceylon</i> ..	248
<i>viride</i> , " " ..	249
<i>Lybas nodulosus</i> , <i>Dist.</i> , <i>Sikkim</i>	231
<i>Ortonia natalensis</i> , <i>Doug.</i> , <i>Natal</i>	86
<i>Pendulinus orientalis</i> , <i>Dist.</i> , <i>Sikkim</i>	231
<i>Prionolomia aberrans</i> , " "	230
<i>pallescens</i> , " <i>Assam</i>	230
<i>Pseudococcus ulicis</i> , <i>Doug.</i> , <i>England</i>	88
<i>ulmi</i> , " "	124
<i>Scolopostethus neglectus</i> , <i>Edw.</i> , <i>England</i> ..	279
<i>punctatus</i> , " " ..	279
<i>Typhlocyba avellanæ</i> , " " ..	157
<i>hippocastani</i> , " " ..	157
<i>opaca</i> , " " ..	158
<i>pruni</i> , " " ..	158

LEPIDOPTERA.

SPECIES.	PAGE
<i>Amblypodia Sophrosyne</i> , <i>H. G. Smith</i> , <i>Solomon I.</i> ..	300
<i>Argyronympha rubianensis</i> , " " ..	299
<i>ulava</i> , " " ..	299
<i>Belemnina Whiteleyi</i> , <i>Herb. Druce</i> , <i>B. Guiana</i> ..	62
<i>Charaxes Attila</i> , <i>H. G. Smith</i> , <i>Solomon I.</i> ..	301
<i>Cyclopides puelmæ</i> , <i>B. Calvert</i> , <i>Chili</i> ..	34
<i>Elodina umbratica</i> , <i>H. G. Smith</i> , <i>Solomon I.</i> ..	302
<i>Epischnia Bankesiella</i> , <i>Richardson</i> , <i>England</i> ..	63
<i>Histia dolens</i> , <i>Herb. Druce</i> , <i>Celebes</i> ..	62
<i>Larinopoda albula</i> , <i>Ham. Druce</i> , <i>W. Africa</i> ..	108
<i>Liptena rubrica</i> , " " ..	108
<i>Milionia Pryeri</i> , <i>Herb. Druce</i> , <i>Loo-Choo</i> ..	62
<i>Mycalesis interrupta</i> , <i>H. G. Smith</i> , <i>Solomon I.</i> ..	299
<i>Nepticula fulgens</i> , <i>Stainton</i> , <i>England</i> ..	12
<i>Papilio Ariel</i> , <i>H. G. Smith</i> , <i>Solomon I.</i> ..	303
<i>Prospero</i> , " " ..	302
<i>Pieris agnata</i> , " " ..	301
<i>Pseuderesia Helena</i> , <i>Ham. Druce</i> , <i>W. Africa</i> ..	108
<i>Teriomima melissa</i> , " " ..	109
<i>Thecla Alcestis</i> , <i>H. G. Smith</i> , <i>Solomon I.</i> ..	300
<i>Tingra tripunctata</i> , <i>Ham. Druce</i> , <i>W. Africa</i> ..	109

ADDITIONS TO THE BRITISH INSECT FAUNA BROUGHT FORWARD IN THIS VOLUME.

COLEOPTERA.

	PAGE
<i>Adrastus pusillus</i> , <i>F.</i>	133
<i>Anaspis Garneysi</i> , <i>Fowler</i>	333
<i>melanostoma</i> , <i>Costa</i>	335

DIPTERA.

<i>Allæostylus sudeticus</i> , <i>Schnb.</i>	396
<i>Amalopis claripennis</i> , <i>Verrall</i>	97
<i>Chortophila curvicauda</i> , <i>Zett.</i>	449
<i>Dasyphora cyanella</i> , <i>Meig.</i>	281
<i>Diplosis fraxinella</i> , <i>Meade</i> ..	77
<i>Hydrotæa parva</i> , <i>Meade</i>	448
<i>Hyetodesia consobrina</i> , <i>Zett.</i>	395
<i>Myopa polystigma</i> , <i>Rond.</i>	281
<i>Pachyrrhina analis</i> , <i>Schum.</i>	21
<i>Pegomyia transgressa</i> , <i>Zett.</i>	449
<i>Sarcophaga fulvicauda</i> , <i>Meade</i>	28
<i>Spilogaster atripes</i> , „	425
<i>fratercula</i> , <i>Zett.</i>	425
<i>spinifemorata</i> , <i>Meade</i>	426
<i>Syrphus excisus</i> , <i>Zett.</i>	379
<i>Theria muscaria</i> , <i>Meig.</i>	27, 379
<i>Tipula excisa</i> , <i>Schum.</i>	22, 25
<i>hortulana</i> , <i>Meig.</i>	23, 25
<i>pelio stigma</i> , <i>Schum.</i>	24, 26
<i>signata</i> , <i>Stäg.</i>	23, 24
<i>truncorum</i> , <i>Meig.</i>	22

HEMIPTERA.

	PAGE
<i>Amblytylus delicatus</i> , <i>Perris</i>	78
<i>Anthocoris visci</i> , <i>Doug.</i>	427
<i>Ischnocoris angustulus</i> , <i>Boh.</i>	149
<i>Lecanium bituberculatum</i> , <i>Sign.</i>	59
<i>lauri</i> , <i>Boisd.</i>	57
<i>Lygus viscidola</i> , <i>Puton</i>	396, 457
<i>Monanthia angustata</i> , <i>H.-S.</i>	34
<i>Pseudococcus ulicis</i> , <i>Doug.</i>	88
<i>ulmi</i> , „	124
<i>Scolopostethus neglectus</i> , <i>Edw.</i>	279
<i>punctatus</i> , „	279
<i>Typhlocyba avellanæ</i> , „	157
<i>hippocastani</i> , „	157
<i>opaca</i> , „	158
<i>pruni</i> , „	158

HYMENOPTERA.

<i>Apanteles hoplites</i> , <i>Rtzb.</i>	282
--	-----

LEPIDOPTERA.

<i>Acrolepia assectella</i> , <i>Zell.</i>	291
<i>Epischnia Bankesiella</i> , <i>Robinson</i>	63
<i>Nepticula fulgens</i> , <i>Stn.</i>	12
<i>Retinia posticana</i> , <i>Zett.</i> ...	146, 181, 196, 209

NEUROPTERA.

<i>Agapetus delicatulus</i> , <i>McLach.</i>	235
<i>Lype fragilis</i> , <i>Pict.</i>	235
<i>Setodes punctata</i> , <i>F.</i>	383

ORTHOPTERA.

<i>Forficula pubescens</i> , <i>Géné</i>	358
--	-----

LARVÆ OF BRITISH SPECIES DESCRIBED IN THIS VOLUME.

	PAGE
<i>Agriotypus armatus</i> , <i>Klapálek</i>	339
<i>Antithesia ustulana</i> , <i>Bird</i>	92
<i>Apatania muliebris</i> , <i>Klapálek</i>	241
<i>Aplota palpella</i> , <i>Warren</i>	174
<i>Butalis laminella</i> , <i>Bankes</i>	16
<i>Cateremna terebrella</i> , <i>Barrett</i>	110
<i>Coccyx argyraea</i> , <i>Wood</i>	218
<i>splendidulana</i> , „	218
<i>Cosmia affinis</i> , <i>Porritt</i>	298
<i>Crambus inquinatellus</i> , <i>Warren</i>	171
<i>Eccopsis latifasciana</i> , „	172
<i>Ephippiphora gallicolana</i> , <i>Wood</i>	219
<i>Euclidia mi</i> , <i>Porritt</i> ..	13
<i>Eupithecia extensaria</i> , <i>Barrett</i>	258

	PAGE
<i>Gelechia peliella</i> , <i>Warren</i>	161
<i>Grapholitha littorana</i> , „	173
<i>Heusimene fimbriana</i> , <i>Wood</i>	218
<i>Homœosoma nimbella</i> , <i>Porritt</i>	245
<i>Lobesia permixtana</i> , <i>Wood</i>	66
<i>Phaleria cadaverina</i> , <i>Fowler</i>	304
<i>Philopotamus montanus</i> , <i>Morton</i>	90
<i>Platyptilia gonodactyla</i> , <i>Tutt</i>	104
<i>Prays Curtisellus</i> , <i>Chapman</i>	73
<i>Retinia posticana</i> , <i>Warren</i>	307
<i>Scoparia cembræ</i> , <i>Wood</i>	126
<i>Sericoris fuligana</i> , <i>Barrett</i>	430
<i>Tortrix decretana</i> , <i>Atmore</i>	244
<i>Ypsolophus Schmidtiellus</i> , <i>Baker</i>	136

REVIEWS.

	PAGE
Revisio Synonymica Heteropterorum Palæarcticorum: O. M. Reuter.....	68
Handbuch für Insekten-Sammler; die Käfer: A. Bau	69
Natural History of Hastings and vicinity; Second Supplement	70
Catálogo de los Coleópteros de Chile: F. Phillippi	70
The Butterflies of North America: W. H. Edwards.....	71, 263, 385
A Synopsis of the Aphididæ of Minnesota: O. W. Oestlund	94
Entomology for beginners: A. S. Packard	140
The origin of floral structure through Insects: Rev. G. Henslow	141
A List of British Diptera: G. H. Verrall.....	143
An Introduction to Entomology: J. H. Comstock	165
Catalogue raisonné des Orthoptères et des Névroptères de Belgique: E. de Selys-Longchamps	165
Insect Life	165
Beiträge zur Kenntniss der schweizerischen Trichopteren: Fr. Ris.....	327
A Contribution towards a Catalogue of the Neuroptera of Ireland: J. J. F. X. King	327
Répertoire alphabétique des noms spécifiques dans la sous-famille des Libellulines: ..	
	A. P. de Borre 328
Report of the Entomologist for the year 1888: C. V. Riley	385
Catalogue raisonné des Névroptères observés dans les Pays Bas: H. Albarda	402

OBITUARY.

	PAGE		PAGE
Philip Henry Gosse, F.R.S.	113	Dr. Victor Signoret	309
John Scott	114	Frederick Bond, F.Z.S.	384
Jacques C. Puls ..	262	Theodor Kirsch	402
Rev. J. G. Wood, M.A.....	263	Rev. H. J. Gore, M.A.	402
August Emil Holmgrèn	309		

ERRATA.

Page	22,	line 18 from bottom,	for "Wings" read "Thorax."
"	23	" 2 " "	for " <i>melanoceros</i> " read " <i>melanoceras</i> ."
"	97.	The whole parenthesis []	should come after the description of <i>Amalopis claripennis</i> , on page 99.
"	247,	line 19 from top,	for "Froms" read "From."
"	"	" 15 " bottom,	for "Tortriciform," read "Tortriciform."
"	274	" 4 " "	for "F. F. Freeman" read "F. C. Lemann."
"	281	" 14 " top,	for " <i>nobiletata</i> " read " <i>nobilitata</i> ."
"	424	" 21 " "	for "NIGRICOLA" read "NIGRICOLOR."
"	437	" 2 " bottom,	for "Ireland" read "Iceland."

No. 289.]

JUNE, 1888.

[PRICE 6d.

THE ENTOMOLOGIST'S MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S. H. T. STANTON, F.R.S.

VOL. XXV.

"J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise."—*Laboulbène*.

LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

E. G. MEEK, Naturalist,
56, BROMPTON ROAD, LONDON, S.W.,
Supplies Entomologists with every Requisite

OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

- Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
 Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
 Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
 Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
 Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
 Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)
 Bottle of Killing Fluid, 9d
 Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
 Mahogany Pocket Box, with glass to slide in groove, 4/6
 Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz.,
 Exchange Lists, 1d. (Postage, 1½d.)
 Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
 Setting and Drying House, complete, 10/6, 12/6, and 15/6
 Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.
 The Entomologist's Store and Setting House, containing every requisite, £3
 Improved Pocket Lanthorns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6
 Pupa Diggers, 2/ and 3/ Beating Tray, 15/
 Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
 Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.
 Breeding Cage, 2/6; with Two Compartments, 5/
 The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
 The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6
A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.
DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH,

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND Co., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von Dr. F. KARSCH, in Berlin (formerly Dr. KATTER, Putbus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month, 7s. 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLANDER & SOHN, N.W. Carlstrasse, 11

No. 290.]

JULY, 1888.

[PRICE 6d.]

THE ENTOMOLOGIST'S MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S.

H. T. STANTON, F.R.S.

VOL. XXV.

“J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise.”—*Laboulbène.*

LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

E. G. MEEK, Naturalist,
56, BROMPTON ROAD, LONDON, S.W.,
Supplies Entomologists with every Requisite

OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
 Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
 Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
 Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
 Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6.
 Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)

Bottle of Killing Fluid, 9d
 Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
 Mahogany Pocket Box, with glass to slide in groove, 4/6
 Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per ez.,
 Exchange Lists, 1d. (Postage, 1½d.)

Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
 Setting and Drying House, complete, 10/6, 12/6, and 15/6
 Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.

The Entomologist's Store and Setting House, containing every requisite, £3
 Improved Pocket Lanthorns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6
 Pupa Diggers, 2/ and 3/ Beating Tray, 15/

Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
 Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.

Breeding Cage, 2/6; with Two Compartments, 5/-

The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6

The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6

A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.
DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH;

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND Co., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von Dr. F. KARSCH, in Berlin (formerly Dr. KATTER, Puthus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month, 7s. 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLANDER & SOHN, N.W. Carlstrasse, 11

No. 291.]

AUGUST, 1888.

[PRICE 6d.

THE
ENTOMOLOGIST'S
MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S.

H. T. STANTON, F.R.S.

VOL. XXV

—
"J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise."—*Laboulbène*.
—

LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

E. G. MEEK, Naturalist,
56, BROMPTON ROAD, LONDON, S.W.,

Supplies Entomologists with every Requisite
OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
 Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
 Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
 Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
 Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
 Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)

Bottle of Killing Fluid, 9d
 Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
 Mahogany Pocket Box, with glass to slide in groove, 4/6
 Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz.,
 Exchange Lists, 1d. (Postage, 1½d.)

Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
 Setting and Drying House, complete, 10/6, 12/6, and 15/6
 Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.

The Entomologist's Store and Setting House, containing every requisite, £3
 Improved Pocket Lanthorns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6

Pupa Diggers, 2/ and 3/ Beating Tray, 15/
 Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
 Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.

Breeding Cage, 2/6; with Two Compartments, 5/
 The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
 The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6

A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.
DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.
 ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.
SHOW ROOM FOR CABINETS
CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH,

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND Co., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von Dr. F. KARSCH, in Berlin (formerly Dr. KATTER, Putbus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month, 7s. 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLANDER & SOHN, N.W. Carlstrasse, 11

LIBRA 183 774
SEP 10 1888
SMITHSONIAN DEPOSIT

No. 292.]

SEPTEMBER, 1888.

[PRICE 6d.]

THE ENTOMOLOGIST'S MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S.

H. T. STAINTON, F.R.S.

VOL. XXV.

"J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise."—*Laboulbène.*

LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

E. G. MEEK, Naturalist, 56, BROMPTON ROAD, LONDON, S.W., Supplies Entomologists with every Requisite

OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

- Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)
Bottle of Killing Fluid, 9d
Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
Mahogany Pocket Box, with glass to slide in groove, 4/6
Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz.,
Exchange Lists, 1d. (Postage, 1½d.)
Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
Setting and Drying House, complete, 10/6, 12/6, and 15/6
Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.
The Entomologist's Store and Setting House, containing every requisite, £3
Improved Pocket Lanthorns, 4/ and 5/ Zinc Oval Pocket Box, 1/6, 2/, and 2/6
Pupa Diggers, 2/ and 3/ Beating Tray, 15/
Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.
Breeding Cage, 2/6; with Two Compartments, 5/
The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6

A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.
DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH,

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND CO., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von Dr. F. KARSCH, in Berlin (formerly Dr. KATTER, Puthus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month, 7s. 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLANDER & SOHN, N.W. Carlstrasse, 11

No. 293.]

OCTOBER, 1888.

[PRICE 6d.]

THE ENTOMOLOGIST'S MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

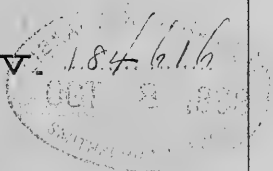
J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S.

H. T. STANTON, F.R.S.

VOL. XXV.



“J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise.” — *Laboulbène*.

LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

E. G. MEEK, Naturalist,
56, BROMPTON ROAD, LONDON, S.W.,
Supplies Entomologists with every Requisite
OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

- Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
 Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
 Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
 Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
 Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
 Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)
 Bottle of Killing Fluid, 9d
 Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
 Mahogany Pocket Box, with glass to slide in groove, 4/6
 Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz.,
 Exchange Lists, 1d. (Postage, 1½d.)
 Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
 Setting and Drying House, complete, 10/6, 12/6, and 15/6
 Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.
 The Entomologist's Store and Setting House, containing every requisite, £3
 Improved Pocket Lanthorns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6
 Pupa Diggers, 2/ and 3/ Beating Tray, 15/
 Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
 Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.
 Breeding Cage, 2/6; with Two Compartments, 5/
 The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
 The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6

A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.
DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH,

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND Co., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von Dr.
 F. KARSCH, in Berlin (formerly Dr. KÄTTER, Putbus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month, 7s. 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLANDER & SOHN, N.W. Carlstrasse, 11

No. 294.]

NOVEMBER, 1888.

186141
NOV [PRICE 6d.]

THE ENTOMOLOGIST'S MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S. H. T. STANTON, F.R.S.

VOL. XXV.

“J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise.”—*Laboulbène*.

LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

E. G. MEEK, Naturalist,
56, BROMPTON ROAD, LONDON, S.W.,
Supplies Entomologists with every Requisite
OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
 Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
 Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
 Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
 Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
 Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)
 Bottle of Killing Fluid, 9d
 Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
 Mahogany Pocket Box, with glass to slide in groove, 4/6
 Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz.,
 Exchange Lists, 1d. (Postage, 1½d.)
 Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
 Setting and Drying House, complete, 10/6, 12/6, and 15/6
 Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.
 The Entomologist's Store and Setting House, containing every requisite, £3
 Improved Pocket Lanthorns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6
 Pupa Diggers, 2/ and 3/ Beating Tray, 15/
 Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
 Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.
 Breeding Cage, 2/6; with Two Compartments, 5/
 The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
 The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6

A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.

DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH;

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND Co., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von DR. F. KARSCH, in Berlin (formerly Dr. KATTER, Putbus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month, 7s. 6d.

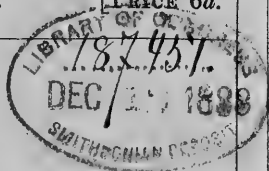
The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLANDER & SOHN, N.W. Carlstrasse, 11

No. 295.]

DECEMBER, 1888.

[PRICE 6d.]



THE
ENTOMOLOGIST'S
MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S. H. T. STANTON, F.R.S.

VOL. XXV.

“J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise.”—*Laboulbène*.

LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

E. G. MEEK, Naturalist,
56, BROMPTON ROAD, LONDON, S.W.,
Supplies Entomologists with every Requisite
OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

- Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
 Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
 Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
 Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
 Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
 Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)
 Bottle of Killing Fluid, 9d
 Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
 Mahogany Pocket Box, with glass to slide in groove, 4/6
 Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz.,
 Exchange Lists, 1d. (Postage, 1½d.)
 Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
 Setting and Drying House, complete, 10/6, 12/6, and 15/6
 Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.
 The Entomologist's Store and Setting House, containing every requisite, £3
 Improved Pocket Lanterns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6
 Pupa Diggers, 2/ and 3/ Beating Tray, 15/
 Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
 Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.
 Breeding Cage, 2/6; with Two Compartments, 5/
 The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
 The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6

A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.
DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH;

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND CO., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von DR. F. KARSCH, in Berlin (formerly Dr. KATTER, Putbus).

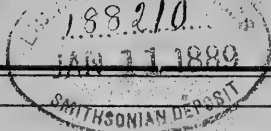
Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month, 7s. 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLÄNDER & SOHN, N.W. Carlstrasse, 11



No. 296.]

JANUARY, 1889.

[PRICE 6d.]

THE ENTOMOLOGIST'S MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S. H. T. STANTON, F.R.S.

VOL. XXV.

“J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise.”—*Laboulbène*.

LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

H. G. MEEK, Naturalist, 56, BROMPTON ROAD, LONDON, S.W., **Supplies Entomologists with every Requisite**

OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

- Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)
Bottle of Killing Fluid, 9d
Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
Mahogany Pocket Box, with glass to slide in groove, 4/6
Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz.,
Exchange Lists, 1d. (Postage, 1½d.)
Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
Setting and Drying House, complete, 10/6, 12/6, and 15/6
Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.
The Entomologist's Store and Setting House, containing every requisite, £3
Improved Pocket Lanthorns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6
Pupa Diggers, 2/ and 3/ Beating Tray, 15/
Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.
Breeding Cage, 2/6; with Two Compartments, 5/
The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6

**A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.
DEALER IN BRITISH AND FOREIGN BIRD SKINS.**

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH,

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND Co., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von Dr. F. KARSCH, in Berlin (formerly Dr. KATTER, Putbus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month, 7s. 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLANDER & SOHN, N.W. Carlstrasse, 11

No. 297.]

FEBRUARY, 1889.

[PRICE 6d.

THE ENTOMOLOGIST'S MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S.

H. T. STANTON, F.R.S.

VOL. XXV.

"J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise."—*Laboulbène.*

LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

E. G. MEEK, Naturalist,
56, BROMPTON ROAD, LONDON, S.W.,
Supplies Entomologists with every Requisite

OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

- Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
 Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
 Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
 Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
 Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
 Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)
 Bottle of Killing Fluid, 9d
 Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
 Mahogany Pocket Box, with glass to slide in groove, 4/6
 Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz.,
 Exchange Lists, 1d. (Postage, 1½d.)
 Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
 Setting and Drying House, complete, 10/6, 12/6, and 15/6
 Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.
 The Entomologist's Store and Setting House, containing every requisite, £3
 Improved Pocket Lanthorns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6
 Pupa Diggers, 2/ and 3/ Beating Tray, 15/
 Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
 Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.
 Breeding Cage, 2/6; with Two Compartments, 5/
 The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
 The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6

A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.

DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH,

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND Co., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von DR. F. KARSCH, in Berlin (formerly Dr. KATZ, Putbus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month, 7s. 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLANDER & SOHN, N.W. Carlstrasse, 11

No. 298.]

MARCH, 1889.

[PRICE 6d.]

THE ENTOMOLOGIST'S MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

J. W. DOUGLAS, F.E.S.

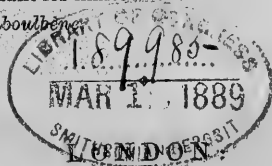
E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S.

H. T. STANTON, F.R.S.

VOL. XXV.

"J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise." — *Laboulbène*



GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

E. G. MEEK, Naturalist,
56, BROMPTON ROAD, LONDON, S.W.,
Supplies Entomologists with every Requisite

OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

- Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
 Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
 Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
 Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
 Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
 Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)
 Bottle of Killing Fluid, 9d
 Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
 Mahogany Pocket Box, with glass to slide in groove, 4/6
 Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz.,
 Exchange Lists, 1d. (Postage, 1½d.)
 Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
 Setting and Drying House, complete, 10/6, 12/6, and 15/6
 Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.
 The Entomologist's Store and Setting House, containing every requisite, £3
 Improved Pocket Lanthorns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6
 Pupa Diggers, 2/ and 3/ Beating Tray, 15/
 Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
 Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.
 Breeding Cage, 2/6; with Two Compartments, 5/
 The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
 The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6
A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.
DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH,

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND CO., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von Dr. F. KARSCH, in Berlin (formerly Dr. KATTER, Putbus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month; 7s. 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLÄNDER & SOHN, N.W. Carlstrasse, 11

No. 299.]

APRIL, 1889.

[PRICE 6d.]

THE ENTOMOLOGIST'S MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S. H. T. STANTON, F.R.S.

VOL. XXV.

"J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise."—*Laboulbène.*

LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

E. G. MEEK, Naturalist,
56, BROMPTON ROAD, LONDON, S.W.,
Supplies Entomologists with every Requisite

OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

- Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
 Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
 Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
 Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
 Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
 Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)
 Bottle of Killing Fluid, 9d.
 Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
 Mahogany Pocket Box, with glass to slide in groove, 4/6
 Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz.,
 Exchange Lists, 1d. (Postage, 1½d.)
 Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
 Setting and Drying House, complete, 10/6, 12/6, and 15/6
 Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.
 The Entomologist's Store and Setting House, containing every requisite, £3
 Improved Pocket Lanthorns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6
 Pupa Diggers, 2/ and 3/ Beating Tray, 15/
 Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
 Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.
 Breeding Cage, 2/6; with Two Compartments, 5/
 The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
 The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6

A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.
DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH,

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND Co., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von Dr. F. KARSCH, in Berlin (formerly Dr. KATTER, Putbus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month; 7s. 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLANDER & SOHN, N.W. Carlstrasse, 11

No. 300.]

MAY, 1889.

[PRICE 6d.]

THE ENTOMOLOGIST'S MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

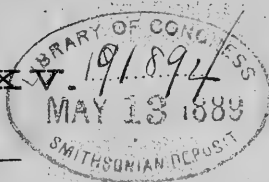
J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S.

H. T. STANTON, F.R.S.

VOL. XXV.



“J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise.”—*Laboulbène*.

LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

E. G. MEEK, Naturalist,
56, BROMPTON ROAD, LONDON, S.W.,
Supplies Entomologists with every Requisite
OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

- Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
 Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
 Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
 Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
 Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
 Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)
 Bottle of Killing Fluid, 9d
 Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
 Mahogany Pocket Box, with glass to slide in groove, 4/6
 Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz.,
 Exchange Lists, 1d. (Postage, 1½d.)
 Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
 Setting and Drying House, complete, 10/6, 12/6, and 15/6
 Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.
 The Entomologist's Store and Setting House, containing every requisite, £3
 Improved Pocket Lanterns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6
 Pupa Diggers, 2/ and 3/ Beating Tray, 15/
 Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
 Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.
 Breeding Cage, 2/6; with Two Compartments, 5/
 The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
 The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6

A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.
DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH,

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND Co., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von Dr.
 F. KARSOCH, in Berlin (formerly Dr. KATTEB, Putbus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month, 7s; 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLÄNDER & SOHN, N.W. Carlstrasse, 11.

No. 301.]

JUNE, 1889.

[PRICE 6d.

192924
JUN 15 1889

THE
ENTOMOLOGIST'S
MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S. H. T. STANTON, F.R.S.

VOL. XXV.

—◆—

“J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise.”—*Laboulbène*.

—◆—

LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

E. G. MEEK, Naturalist,
56, BROMPTON ROAD, LONDON, S.W.,
Supplies Entomologists with every Requisite

OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
 Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
 Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
 Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
 Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
 Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)
 Bottle of Killing Fluid, 9d
 Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
 Mahogany Pocket Box, with glass to slide in groove, 4/6
 Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz..
 Exchange Lists, 1d. (Postage, 1½d.)
 Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
 Setting and Drying House, complete, 10/6, 12/6, and 15/6
 Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.
 The Entomologist's Store and Setting House, containing every requisite, £3
 Improved Pocket Lanterns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6
 Pupa Diggers, 2/ and 3/ Beating Tray, 15/
 Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
 Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.
 Breeding Cage, 2/6; with Two Compartments, 5/
 The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
 The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6

A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.
DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH,

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND Co., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von DR. F. KARSCH, in Berlin (formerly Dr. KATTER, Putbus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month, 7s. 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLÄNDER & SOHN, N.W. Carlstrasse, 11

No. 302.]

JULY, 1889.

[PRICE 6d.]

THE
ENTOMOLOGIST'S
MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S.

H. T. STANTON, F.R.S.

VOL. XXV.

"J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise."—*Laboulbène*.

LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

E. G. MEEK, Naturalist,
56, BROMPTON ROAD, LONDON, S.W.,
Supplies Entomologists with every Requisite
OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
 Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
 Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
 Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
 Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
 Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)
 Bottle of Killing Fluid, 9d
 Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
 Mahogany Pocket Box, with glass to slide in groove, 4/6
 Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz.,
 Exchange Lists, 1d. (Postage, 1½d.)
 Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
 Setting and Drying House, complete, 10/6, 12/6, and 15/6
 Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.
 The Entomologist's Store and Setting House, containing every requisite, £3
 Improved Pocket Lanthorns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6
 Pupa Diggers, 2/ and 3/ Beating Tray, 15/
 Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
 Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.
 Breeding Cage, 2/6; with Two Compartments, 5/
 The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
 The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6

A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.
DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH;

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND Co., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von DR. F. KARSCH, in Berlin (formerly Dr. KATTER, Putbus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month, 7s. 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLANDER & SOHN, N.W. Carlstrasse, 11

No. 303.]

AUGUST, 1889.

[PRICE 6d.]

THE
ENTOMOLOGIST'S
MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S. H. T. STANTON, F.R.S.

VOL. XXIV. 131889



“J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise.”—*Laboulbène*.

LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

E. G. G. MEERK, *Naturalist*,
56, BROMPTON ROAD, LONDON, S.W.,

Supplies Entomologists with every Requisite OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

- Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)
Bottle of Killing Fluid, 9d.
Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
Mahogany Pocket Box, with glass to slide in groove, 4/6
Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz.,
Exchange Lists, 1d. (Postage, 1½d.)
Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
Setting and Drying House, complete, 10/6, 12/6, and 15/6
Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.
The Entomologist's Store and Setting House, containing every requisite, £3
Improved Pocket Lanthorns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6
Pupa Diggers, 2/ and 3/ Beating Tray, 15/
Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.
Breeding Cage, 2/6; with Two Compartments, 5/
The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6

A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.
DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH,

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND Co., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von DR.
F. KARSOH, in Berlin (formerly Dr. KATTEB, Putbus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month, 7s. 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLANDER & SOHN, N.W. Carlstrasse, 11

No. 304.]

SEPTEMBER, 1889.

[PRICE 6d.]

THE
ENTOMOLOGIST'S
MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S. H. T. STANTON, F.R.S.

VOL. XXV.

"J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise."—*Laboulbène.*

193-624

LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

E. G. MEEK, Naturalist,
56, BROMPTON ROAD, LONDON, S.W.,
Supplies Entomologists with every Requisite

OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

- Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
 Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
 Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
 Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
 Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
 Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)
 Bottle of Killing Fluid, 9d.
 Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
 Mahogany Pocket Box, with glass to slide in groove, 4/6
 Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz.,
 Exchange Lists, 1d. (Postage, 1½d.)
 Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
 Setting and Drying House, complete, 10/6, 12/6, and 15/6
 Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.
 The Entomologist's Store and Setting House, containing every requisite, £3
 Improved Pocket Lanthorns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6
 Pupa Diggers, 2/ and 3/ Beating Tray, 15/
 Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
 Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.
 Breeding Cage, 2/6; with Two Compartments, 5/
 The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
 The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6

A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.
DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH,

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND Co., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von Dr. F. KARSCH, in Berlin (formerly Dr. KATTER, Putbus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month, 7s. 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

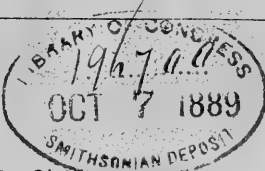
Berlin: R. FRIEDLÄNDER & SOHN, N.W. Carlstrasse, 11

No. 305.]

OCTOBER, 1889.

[PRICE 6d.]

THE



ENTOMOLOGIST'S MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S.

H. T. STANTON, F.R.S.

VOL. XXV.

“J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise.”—*Laboulbène*.

LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

E. G. MEEK, Naturalist,
56, BROMPTON ROAD, LONDON, S.W.,
Supplies Entomologists with every Requisite

OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

- Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
 Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
 Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
 Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
 Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
 Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)
 Bottle of Killing Fluid, 9d
 Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
 Mahogany Pocket Box, with glass to slide in groove, 4/6
 Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz.,
 Exchange Lists, 1d. (Postage, 1½d.)
 Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
 Setting and Drying House, complete, 10/6, 12/6, and 15/6
 Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.
 The Entomologist's Store and Setting House, containing every requisite, £3
 Improved Pocket Lanthorns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6
 Pupa Diggers, 2/ and 3/ Beating Tray, 15/
 Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
 Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.
 Breeding Cage, 2/6; with Two Compartments, 5/
 The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
 The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6

A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.
DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH,

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND Co., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von DR. F. KARSCH, in Berlin (formerly Dr. KATTE, Putbus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month, 7s. 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLÄNDER & SOHN, N.W. Carlstrasse, 11.

No. 306.]

NOVEMBER, 1889.

[PRICE 6d.]

THE
ENTOMOLOGIST'S
MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

B. M'LACHLAN, F.R.S.

J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S. H. T. STANTON, F.R.S.

— 1981/2
NOV 2 1889 —
VOL. XXV.

— ◆ —
"J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise."—*Laboulbène*.

— ◆ —
LONDON:

GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

E. G. MEEK, Naturalist,
56, BROMPTON ROAD, LONDON, S.W.,
Supplies Entomologists with every Requisite

OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
 Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
 Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
 Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
 Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
 Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)
 Bottle of Killing Fluid, 9d.
 Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
 Mahogany Pocket Box, with glass to slide in groove, 4/6
 Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz.,
 Exchange Lists, 1d. (Postage, 1 1/2d.)
 Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
 Setting and Drying House, complete, 10/6, 12/6, and 15/6
 Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.
 The Entomologist's Store and Setting House, containing every requisite, £3
 Improved Pocket Lanterns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6
 Pupa Diggers, 2/ and 3/ Beating Tray, 15/
 Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
 Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.
 Breeding Cage, 2/6; with Two Compartments, 5/
 The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
 The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6

A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.
DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH,

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND Co., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von Dr.
 F. KARSCH, in Berlin (formerly Dr. KATTEr, Putbus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month; 7s. 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLÄNDER & SOHN, N.W. Carlstrasse, 11

No. 307.]

DECEMBER, 1889.

[PRICE 6d.

THE ENTOMOLOGIST'S MONTHLY MAGAZINE.

CONDUCTED BY

C. G. BARRETT, F.E.S.

R. M'LACHLAN, F.R.S.

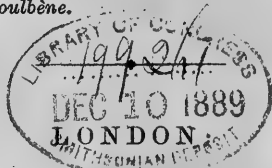
J. W. DOUGLAS, F.E.S.

E. SAUNDERS, F.L.S.

W. W. FOWLER, M.A., F.L.S. H. T. STANTON, F.R.S.

VOL. XXV.

"J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise."—*Laboulbène.*



GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS),
1, PATERNOSTER ROW.

E. G. MEEK, Naturalist,
56, BROMPTON ROAD, LONDON, S.W.,
Supplies Entomologists with every Requisite
OF THE BEST MAKE.

NEW PRICED CATALOGUE ON RECEIPT OF STAMP.

All Orders, when accompanied by Post Office Order, will receive immediate attention.

- Steel Knuckle Jointed Net, folds up for pocket, 4/6 Self-acting ditto, 7/6
 Ladies' Umbrella Net, 5/ Cane Ring Net, with Stick, 2/ Wire ditto, with Brass Screw, 2/
 Pocket Folding Net, 3 Brass Joints, 3/6 & 4/6 Balloon Net, 26 x 18, for Beating, &c., 6/
 Telescope Net, 6/, 8/6, & 10/6 Self-acting Sweeping Net, 8/
 Larva Box, 6d., 1/, 1/6, & 2/ Sugaring Tins, with Brush affixed, 2/6,
 Pocket Relaxing Box, 3/ Killing Box, 9d. & 1/ (new principle)
 Bottle of Killing Fluid, 9d
 Corked Setting Boards, 6d, 7d, 8d, 9d, 10d, 11d, 1/, 1/2, 1/4, 1/6, 1/8, 1/10, & 2/ each
 Mahogany Pocket Box, with glass to slide in groove, 4/6
 Entomological Pins, any size, Gilt or Plain, 1/ per box. Four Sizes, mixed, 1/ per oz.,
 Exchange Lists, 1d. (Postage, 1½d.)
 Bottle of Mite Destroyer, 1/ Willow Chip Boxes, nested, four sizes, 2/6 gross.
 Setting and Drying House, complete, 10/6, 12/6, and 15/6
 Pocket Box, 6d., 9d., 1/, and 1/6 Postal Boxes, 6d.
 The Entomologist's Store and Setting House, containing every requisite, £3
 Improved Pocket Lanthorns, 4/ and 5/, Zinc Oval Pocket Box, 1/6, 2/, and 2/6
 Pupa Diggers, 2/ and 3/ Beating Tray, 15/
 Corked Store Boxes, best make, 2/6, 3/6, 4/, 5/, & 6/ Ditto, covered in Green Cloth,
 Book Pattern, 16 x 11, 8/ Tin Y, 6d.; Brass Y, 1/, for Cane Nets.
 Breeding Cage, 2/6; with Two Compartments, 5/
 The New Glass Killing Bottle, charged ready for use, 1/, 1/3, and 1/6
 The New Sugaring Lantern, burns Benzoline, 5/, 6/, & 10/6

A LARGE ASSORTMENT OF BRITISH INSECTS KEPT IN STOCK.
DEALER IN BRITISH AND FOREIGN BIRD SKINS.

Priced Catalogue on receipt of Stamp.

ENTOMOLOGICAL CABINETS, from Twelve Shillings to Forty Guineas, kept in stock.

SHOW ROOM FOR CABINETS

CABINETS OF EVERY DESCRIPTION MADE TO ORDER. ESTIMATES GIVEN.

Published every Thursday, price 6d.,

NATURE: A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

Yearly Subscription, 28/. Half-Yearly, 14/6. Quarterly, 7/6.

Post Office Orders to be made payable at King Street, Covent Garden, W.C.

The attention of all interested in the general progress of knowledge is earnestly invited to this Journal of Science, which has become the accredited organ of the leading scientific men in both the Old and the New World.

One of the leading objects of the Publishers of *Nature* is to awaken in the public mind a more lively interest in Science. With this end in view, it provides original Articles and Reviews, written by scientific men of the highest distinction in their various departments, expounding in a popular and yet authentic manner, the

GRAND RESULTS OF SCIENTIFIC RESEARCH,

discussing the most recent scientific discoveries, and pointing out the bearing of science upon civilization and progress and its claims to a more general recognition, as well as to a higher place in the educational system of the country.

Every intelligent man is now expected to know something of what is going on in the scientific world; the columns of *Nature* will give a summary of it—varied, compressed, and authentic.

London: MACMILLAN AND Co., Bedford Street, Strand, W.C.

ENTOMOLOGISCHE NACHRICHTEN, herausgegeben von DR.
 F. KARSCH, in Berlin (formerly Dr. KATZ, Putbus).

Published regularly on the 1st and 15th of every month (24 parts a year), with occasional Illustrations and Plates.

Original Papers by German Entomologists, Biological Notes, Descriptions of New Species, Reports on the Progress of Entomology, on the Appearances of Noxious Insects, &c., on New Entomological Literature, Contents of Entomological Periodicals.

Subscription, 6s. a year; free by post twice a month, 7s. 6d.

The best medium for Advertisements on all Entomological subjects, being the only Entomological Periodical published twice a month. Advertisement rates, 7d. for every two lines.

Berlin: R. FRIEDLANDER & SOHN, N.W. Carlstrasse, 11

- "Systematic Temperature Experiments on some Lepidoptera in all their stages:" by Frederic Merrifield, F.E.S.
 "Notes on Indian Longicornia, with Descriptions of New Species:" by Charles J. Gahan, M.A., F.E.S.
 "On the Peculiarities of the Terminal Segment in some male Hemiptera:" by Dr. D. Sharp, F.L.S.
 "Notes on a species of Lycanidae:" by Lionel de Nicéville, F.L.S.

FOR SALE.—Healthy Pupæ of *Machaon*, *cardamines*, *Ageria*, *rubi*, *lucina*, *tiliæ*, *elpenor*, *fuciformis*, *testudo*, *lanestris*, *carpini*, *lunaria*, *zonaria*, *temerata*, *pictaria*, *alternata*, *pulveraria*, *pinaria*, *conspicuata*, *affinitata*, *alchemillata*, *unfasciata*, *linaria*, *pulchellata*, *subfulvata*, *subumbrata*, *isogrammata*, *pygmæata*, *lariciata*, *albipunctata*, *valerianata*, *pimpinellata*, *assimilata*, *exiguata*, *sparsata*, *sexalata*, *hexapterata*, *hastata*, *berberata*, *certata*, *sagittata*, *furcula*, *palpina*, *dodonæa*, or, *ridens*, *Orion*, *venosa*, *flammea*, *capsophila*, *glauca*, *absinthii*, *canella*, *adelphelle*, *chlorana*, &c., &c.; also fine bred specimens of most of the British Macro-Lepidoptera and many good Micros.

FOR PRICE LISTS APPLY TO

W. H. HARWOOD, Colchester.

A LARGE STOCK OF INSECTS BELONGING TO OTHER ORDERS ON HAND.

WATKINS & DONCASTER, Naturalists,

Keep in stock all Articles for Entomologists, Ornithologists, Botanists, &c.: Umbrella Net, 7/6; Folding Cane or Wire, 4/6; Plain Ring, 2/3; Pocket Boxes, 6d., 9d., 1/-, 1/6; Store Boxes, 2/6, 4/-, 5/-, 6/-; Zinc Pocket Boxes, 9d., 1/-, 1/6, 2/-, 4/6; Setting Boards, from 6d. to 1/10; Complete set of 14 boards, 10/6; Breeding Cages, 2/6, 5/-; Sugaring Tins, 1/6, 2/-; Setting Houses, 9/6, 11/6, 14/-; Glass Topped and Glass Bottomed Boxes, from 1/6 to 2/6 per doz.; Zinc Killing Boxes, 9d., 1/-; Coleoptera Collecting Bottles, 1/6; Collecting Box, containing 26 tubes (very useful for Coleopterists, Microscopists, &c.), 5/-.

Improved Pocket Pupa-digger in leather sheath (strongly recommended), 2/6.
 Nickel-plated Steel Forceps, 2/- per pair.

Taxidermists' Companion, containing most necessary implements for skinning, 10/6.
 Scalpels, with ebony handles, 1/3; Fine Pointed Scissors, 2/- per pair; Egg Drills, best quality, 1/- each; Botanical Vasculum, 1/6, 3/6, 4/6, 5/6, &c.

A large stock of British, European, and Exotic Lepidoptera, Coleoptera, and Birds' Eggs.


ENTOMOLOGICAL PINS.

LIVING OVA AND PUPÆ OF MANY SPECIES NOW ON HAND.

Show Room for Cabinets, &c.

Our New Label List of British Macro-Lepidoptera, with Latin & English Names, 1/6.

Our New Catalogue of British Lepidoptera (every species numbered), 1/-;
 or on one side for Labels, 2/-.

 ONLY ADDRESS—

**36, STRAND, W.C., Five Doors from Charing Cross,
 LONDON.**

Birds and Mammals, &c., Preserved & Mounted by first-class workmen.

"NATURALIST" REPRINTS—No. 1.

LIST OF LAND AND FRESH WATER MOLLUSCA OF LANCASHIRE.

By **ROBERT STANDEN.**

This Paper contains not only Mr. Standen's own observations, but also those of Messrs. E. D. Darbishire, Thos. Rogers, W. H. Heathcote, J. A. Hargreaves, F. C. Long, H. Stephenson, and other Conchologists; and the observations published in Dyson's List of 1850, and in Hardy's Lists of 1864 and 1865, are reprinted for comparison. *Leeds: 1887. Price Ninepence (by post, Ninepence halfpenny).*

To be had from the Publishers of "The Naturalist," Park Row, Leeds.

Many important papers and notes, already in hand, will receive attention at the earliest opportunity; mostly in the January No.

CONTENTS.

	PAGE
Trifurcula pallidella in the Isle of Purbeck.— <i>E. R. Bankes, M.A., F.E.S.</i>	445
Remarks on Mr. Jas. Edwards' List of Norfolk Hemiptera.— <i>E. Saunders, F.L.S.</i>	446
Second Supplement to Annotated List of British Anthomyiidae (concluded).— <i>R. H. Meade</i>	448
Synopsis of the British Orthoptera (continued).— <i>Eland Shaw, F.E.S.</i>	450
On breeding <i>Deilephila galii</i> .— <i>Rev. E. N. Bloomfield, M.A.</i>	455
<i>Pterophorus isodactylus</i> in South Dorset.— <i>E. R. Bankes, M.A., F.E.S.</i>	455
<i>Choreutes vibrana</i> in the Isle of Purbeck.— <i>Id.</i>	456
<i>Sphinx convolvuli</i> at West Lulworth.— <i>Id.</i>	456
<i>Sphinx convolvuli</i> at King's Lynn.— <i>C. G. Barrett, F.E.S.</i>	456
A destroyer of larvæ of <i>Zeuzera æsculi</i> .— <i>Id.</i>	456
Larvæ of <i>Boarmia rhomboidaria</i> on Scotch Fir.— <i>C. J. Wainwright</i>	456
<i>Cecophora stipella</i> : its food-plant.— <i>S. T. Ellison</i>	457
Note on <i>Nabis limbatus</i> .— <i>J. Eardley-Mason</i>	457
<i>Lygus viscidula</i> , Puton.— <i>J. W. Douglas, F.E.S.</i>	457
<i>Homalium septentrionis</i> , Thoms., in Warwickshire.— <i>W. G. Blatch</i>	457
<i>Amara nitida</i> , Sturm, a Warwickshire insect.— <i>Id.</i>	458
Birmingham Entomological Society.— <i>Colbran J. Wainwright, Hon. Sec.</i>	458
The South London Entomological and Natural History Society.— <i>H. W. Barker, F.E.S., Hon. Sec.</i>	458
Proceedings of the Entomological Society of London.— <i>H. Goss, F.L.S., Hon. Sec.</i>	459
TITLE PAGE, PREFACE, INDEX, &c.....	i—xxviii

NOTICE TO SUBSCRIBERS.

Vol. XXV ends with the present Number. Subscriptions, 6/- (POST-FREE) for Second Series, Vol. I (or Vol. XXVI, 1890), are now due. Post Office Orders may be sent to the 'Editors' (payable to GEORGE WEBB at the Chief Office),

Care of Gurney & Jackson, 1, Paternoster Row, London, E.C., or to either of them personally at his residence.

Intending new Subscribers should send in their names and addresses as soon as possible.

Any one wishing to discontinue his Subscription must give notice to that effect on or before the 20th inst., otherwise he will be considered liable for the ensuing Vol.; but it is hoped that all supporters will continue their aid, and induce their friends to join at the commencement of a New Series (SEE PREFACE included in this No.).

The Editors are ready to entertain proposals for continuous Advertisements, or for a term.

NOW READY,

THE ENTOMOLOGIST'S MONTHLY MAGAZINE, Vol. XXV (19 months), strongly bound in Cloth. Price 10/6.

Covers for binding Vol. XXV, 1/- each.

IV.B.—Vols. x to xxiv can be had separately, price 7/- each. Vols. i to ix are 10/- each, and can only be obtained by purchasers of the complete set (i to xxv). But the earlier Vols. are out of print, and complete sets can only be had occasionally.

London: GURNEY & JACKSON, 1, Paternoster Row. E.C.

NATURAL HISTORY SPECIMENS.—TUESDAY, DECEMBER 10TH.

MR. J. C. STEVENS will Sell by Auction at his Great Rooms, 38, King Street, Covent Garden, on TUESDAY, DECEMBER 10th, at half-past 12 precisely, Natural History Specimens, comprising British and Foreign Insects, Birds set up in Glass Cases, Bird Skins, Birds' Eggs, Minerals, Fossils, Shells, a large collection of abnormal Natural History Specimens, Cabinets, &c.

On view the day prior, from 2 till 5, and Morning of Sale, and Catalogues had.





25-1888-29.

9 Aug 60

24. x. 66

SMITHSONIAN INSTITUTION LIBRARIES



3 9088 00908 2074